TUBERCULOSIS TREATMENT IN HIGH TB/HIV SETTINGS: EVALUATING PUBLIC-PRIVATE PARTNERSHIPS IN SOUTH AFRICA

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by

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To the memory of my father

ABSTRACT

The aim of this thesis is to evaluate the performance of different models of public-private partnerships in the provision of tuberculosis treatment, and explore incentive mechanisms for private sector participation. It makes recommendations to policy-makers in South Africa and elsewhere on the best way to approach a policy on the enhanced role of private sector providers in tuberculosis treatment in light of the HIV/AIDS epidemic. A common framework is used to analyse the nature of the models, their performance in terms of cost, effectiveness and quality of care, and incentives for private participation. Multiple research methods are employed in order to fully investigate complex situations and to validate the findings. Both quantitative and qualitative methods are used.

The study found that the quality of care is superior in both models of public-private partnerships when compared to the purely public sector model of delivery, and shows that increased collaboration with private providers through partnerships could potentially improve the quality of care and increase access to care. The results of the cost-effectiveness show that, in comparison with the purely public provision, the public-private partnership models could significantly reduce costs to both the public health sector and patient, and increase cost-effectiveness of tuberculosis treatment. Private providers in the existing and potential partnerships have both financial and non-financial motivations and incentives for participation in partnership.

Overall, these public-private partnerships show that there is a strong economic case for expanding the private sector involvement in tuberculosis treatment in South Africa. Expansion may require increased investment in the public-private partnerships, but they seem to be capable of delivering important improvements in the affordability and efficiency of tuberculosis treatment, and improving the South African health system's capacity to cope with the impact of the HIV/AIDS epidemic.

DECLARATION

I formally declare that the work presented in this thesis is the result of my own work.

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Edina Sinanovic

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
BCG	Bacille Calmette Guerin
DALY	Disability-Adjusted Life Years
DOTS	Directly-observed treatment, short course
DOT	Directly-observed treatment
GDP	Gross Domestic Product
GP	General practitioners
HIV	Human immunodeficiency virus
HMO	Health maintenance organisation
KM	Kilometers
LSHTM	London School of Hygiene and Tropical Medicine
MDR-TB	Multi-drug resistant tuberculosis
NDoH	National Department of Health
NGO	Non-governmental organisation
NTCP	National Tuberculosis Control Programme
NTP	National Tuberculosis Programme
NudIST	Non-numerical Unstructured Data Indexing Searching and Theorising
PHC	Primary health care
PMBs	Prescribed minimum benefits
PPP	Public-private partnership
SAMA	South African Medical Association
SANTA	South African National Tuberculosis Association
STI	Sexually-transmitted infection
TB	Tuberculosis
TDR	Special Programme for Research and Training in Tropical Diseases
UCT	University of Cape Town
UNAIDS	United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
VCT	Voluntary counselling and testing
WHO	World Health Organisation

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Chapter 1

INTRODUCTION

In developing countries, health sector reform aims to strengthen basic health services and emphasises the shifting of scarce resources to primary care and prevention (Cassels and Janovsky, 1995). A key feature of health reforms is questioning the belief that the government should provide all citizens care, regardless of their level of income (Cassels, 1995). It is argued that aside from their regulatory role, governments in developing countries should assume responsibility for ensuring the provision of a cost-effective package of basic services for the poor, preferably leaving it to other actors to finance and provide health care for other income groups (Culyer et al., 1988; Donaldson and Gerard, 1993; World Bank, 1993; World Bank 2003). Whether the services for the poor are funded by the government but provided by others is left for country decision-makers to decide (Cassels, 1995).

Tuberculosis control is a classic example of a public health activity that is important for the whole society and is therefore appropriate for government to have a dominant role (World Bank, 1993; Musgrove, 1996; Jack, 2000; 2001). Treatment of tuberculosis has been identified as one of the most important basic health care interventions for the government to finance (Murray et al., 1991; World Bank, 1993). This traditional view that tuberculosis control is a public health concern for which the government has a prime responsibility stems from observed market failures in the health sector. Given significant externalities, there are strong economic grounds to argue that the public sector must play an essential role in tuberculosis control (Jack, 2001). Tuberculosis surveillance, knowledge generation and cross-border control of transmission can all be considered global public goods (Chen et al., 1999) worthy of public finance within reform programmes.

However, more recently it has been argued that tuberculosis control has to be viewed within the context of health sector reforms, which include strengthening of the government's role in providing information, overseeing of regulation, and financing of public health interventions in partnerships with the private sector (Uplekar et al., 2001). Tuberculosis services, which have been demonstrated to deliver one of the most cost-effective health interventions in developing countries (Murray et al, 1991; World Bank, 1993; De Jonghe et al, 1994; Creese et al., 2002), are a particularly good vehicle through which to measure the impact of the health sector reform process (Cassels, 1995). The long-term care required in the successful case-management of tuberculosis cases is a very sensitive indicator of the ability of the health sector to deliver adequate services more broadly (Weil 2000).

The motivation for this thesis arises from a growing concern expressed in the health economics literature about the respective roles of the public and private sectors in health care provision and financing. This has been one of the central issues in health sector initiatives in a range of developing and developed countries. The debate has essentially been about changing the public-private sector mix, and particularly about mechanisms for increasing the role of the private sector. The concept 'public-private mix' is used to describe the share of the public and private (for profit and non-profit) sectors in the provision and financing of health services in a given country (Hanson and Berman, 1998). Public-private partnerships (PPPs) are increasingly seen to be a way of promoting co-operation among public and private health care sectors in developing countries (Bennett, 1992; World Bank, 1993; Gilson and Mills, 1995; Reich 2000). Numerous definitions have been proposed to characterise what partnership means, focusing on objectives, responsibilities and gains. Partnership implies *"a commitment to a common goal through the joint provision of complementary resources and expertise, and the joint sharing of the risks involved"* (Ridley, 2001). Such partnerships may either involve affiliation with international organisations (i.e. public sector programmes with private sector participation) or be legally independent not-for-profit bodies. In the health sector, partnership is seen as a means to *"bring together a set of actors for the common goal of improving the health of populations based on mutually agreed roles and principles"* (Kickbusch and Quick, 1998). According to the World Health Organisation, *"partnership with the private sector could offer some promise of higher case finding rates, improved patient acceptance of directly-observed treatment, and a degree of long term sustainability"* (World Health Organisation, 2001b). This study evaluates PPPs as a mechanism for reducing the role of government whilst increasing the private sector's involvement in the delivery of public health services.

1.1 Theoretical and empirical background

Market failure is the economic rationale for ongoing government intervention in health care where the private sector operates or has predominated (Akerlof, 1970; Arrow and Lind, 1970; Atkinson and Stiglitz, 1980; Culyer, 1991; Musgrove, 1996; Stiglitz, 2000). Some economic theorists argue that few health services have characteristics of a 'public good' and therefore cannot be provided by the market (Arrow, 1963; Atkinson and Stern, 1974; Stiglitz, 1989; Donaldson and Gerard, 1993; Jack, 2000).

Neo-classical economics' theoretical rationale for a limited role of the government stems from its market competition theory (Rosen, 1995). Under this theory, government intervention is not necessary as a properly functioning competitive economy generates a Pareto efficient allocation of resources, and a shift to the private sector ownership may lead to efficiency gains (Donaldson and Gerard, 1993). However, it is widely recognised that perfectly competitive markets do not exist (Arrow, 1970; Akerlof, 1970; Rorthchild and Stiglitz, 1976). New institutional economic theory, which compares different organisational forms and different institutional regulations in relation to their effect on economic efficiency, suggests that, unlike public sector providers, private providers (due to the profit motive) have an incentive to behave efficiently and to be responsive to consumers (Hodgson, 1988; Hart, 1990). The new institutional economics theorists argue that the lack of property rights in the public sector leads to inadequate incentives for efficient behaviour and suggests that private ownership, and the incentives associated with it, may stimulate competition and result in efficient service (Bennett et al., 1997, Turner and Hulme, 1997). According to the 'new public management' framework government should move away from the direct provision of health services to more indirect roles such as contracting for health services or regulating private providers (Stewart, 1993; Jackson and Price, 1994; Walsh, 1995). Whatever form they take, contracts involving the public sector are a response to public choice and property rights theories' diagnosis that government has failed in the efficient provision of quality services, and contracting out is seen as a means of benefiting from private sector efficiency, while maintaining control over what services are to be provided and to whom (Mills, 1997). The key feature of the new public management framework is that the role of the government is not necessarily one of direct service provision, but rather policy making (Hood, 1991; Russell et al., 1999).

In addition to the theoretical arguments, there are also some pragmatic arguments in favour of private sector development in health care. The World Bank (1993) suggests that the private sector may expand access, reduce the administrative and financial burden upon government, and possibly increase overall sectoral efficiency. In the World Development Report (World Bank, 1993), considerable emphasis was placed on the potential of private sector providers to play a complementary role in an overall strategy defined by public interest. The public sector should provide the 'essential' cost-effective services, while the private sector could provide less cost-effective services (World Bank, 1993; 1997; 2003).

Private health care providers in developing countries play an important role in providing care for people with diseases of public health importance, including tuberculosis (Berman, 1995; Bennett et al., 1997; Swan and Zwi, 1997; Brugha and Zwi, 1998; Uplekar et al., 2001; Mills et al., 2002; Uplekar, 2003; Newell et al., 2004). Studies from India have shown that about 60% of TB cases had visited private practitioners when they first developed chest symptoms, and more than half had been diagnosed by private doctors (Juvenkar et al., 1995; Uplekar and Rangan, 1996; Uplekar et al., 1998; Uplekar, 2000; Murthy et al., 2001; Arora et al., 2004a). Studies from Ho Chi Minh City in Vietnam have shown that about half of all TB patients had sought help in the private sector, and up to 40% of all TB cases had been treated in the private sector (Lonnroth, 2000; Lonnroth et al., 2001). In areas of high TB prevalence, it is estimated that expenditure on TB in the private sector outweighs that in the public sector (World Health Organisation, 1994).

The main reasons for consulting private sector providers for the provision of TB treatment are better geographical accessibility, shorter waiting time, longer or more flexible opening hours, greater availability of staff and drugs, greater confidentiality in dealing with diseases such as TB which carry social stigma, and the perception that private service providers are more considerate, caring and sensitive to client concerns (Aljunid, 1995; Uplekar and Rangan, 1996; Lonnorth et al., 2001; Arora et al., 2004b). The positive aspects of the private practitioners' TB related practices are countered in developing country contexts by practices such as excessive reliance on X-rays for diagnosis, their disregard of recommended drug regimens, their virtual inaction with regard to treatment default and their failure to keep even minimum essential records (Uplekar, 1997; Hurtig et al., 2000; Uplekar et al., 2001; Lonnorth et al., 2001; 2003).

Most of the available evidence on the private sector's involvement in the provision of TB treatment comes from Asia. There are a few tried and tested models of effective interventions to encourage private providers to deliver good quality tuberculosis services through public-private mix projects in India, the Philippines, Vietnam and Nepal (Murthy et al., 2001; Mantala, 2003; Quy et al., 2003; Newell et al., 2004). However, these different public-private mix approaches with respect to tuberculosis treatment are small scale and empirical data on their performance is limited. Whilst much of the understanding of the private sector and their involvement in TB treatment comes from Asia, there are extremely limited empirical data on the involvement of private providers in the provision of TB treatment, and even less available evidence on their performance, in Africa.

Effective involvement of the private sector in the provision of TB treatment requires an understanding of the motivations of private providers, their capacity and the existing institutional and organisational capacity to support the interaction. The available evidence supports the call for an increased role for the private sector. However, previous experience and economic theory suggest that, because of differences in motivation between public and private sector actors (the classic problems of agency relationships), broader involvement of private actors raises additional issues of appropriate incentive mechanisms that can be used to achieve converging public-private interests than if we were just looking purely at a public model of delivery alone (Mills et al., 2001). There is not much evidence, however, on how to motivate private providers to provide health care services that are in the public interest. In addition, there is a lack of evidence on the most appropriate incentives in a public-private partnership for delivering TB treatment at the right cost and quality.

1.2 Thesis aim and outline

This study aims to evaluate the performance of different models of public-private partnerships in the delivery of TB treatment in South Africa. It also aims to explore incentive mechanisms for private sector participation in public-private partnerships, in order to make recommendations to policy-makers in South Africa on the best way to approach a policy on the enhanced role of private sector providers in TB treatment.

The specific objectives of the thesis are:

1. To understand the nature of public-private interaction in TB treatment in the African context in light of the HIV/AIDS epidemic.
2. To describe the nature of TB treatment delivery including models of public-private partnerships, in terms of what they are, the nature of partnerships and who is responsible for monitoring them in South Africa.
3. To evaluate specific public-private partnership models of delivery of TB treatment in terms of cost, effectiveness and quality of care, and to compare their performance with that of public sector providers.
4. To explore motivations of partners within existing partnerships, incentive mechanisms attributable to different models of public-private partnerships, potential partners in the provision of TB treatment, and incentive structures for broader public-private partnerships.
5. On the basis of these findings, to make recommendations on how policy-makers in South Africa and elsewhere could best approach a policy on different ways of involving private providers in the provision of TB treatment.

Outline of thesis

Chapter 2 reviews both theoretical and empirical literature on the role of government and the private sector in the health sector, and more specifically for TB treatment. It also presents evidence on the performance of different public-private arrangements for the provision of TB treatment in developing countries. The chapter is divided into two parts. Part one focuses on public-private mix and incentives in the health sector, presenting different economic theories on the role of government in health and discussing public-private mix in the health sector, and the incentives for private participation. Public-private mix arrangements for TB treatment that exist in TB high-burden countries are discussed. Part two looks at the burden of tuberculosis in light of the HIV/AIDS epidemic, and tuberculosis treatment in the private sector. The literature review identifies a number of key gaps and unanswered questions concerning private sector involvement in the provision of TB treatment and public-private mix. The literature review also notes the potentially important role played by context in the performance of public-private partnerships.

Chapter 3 provides background and context in which the public-private partnerships examined in this study are operating in South Africa. The public-private mix of the South African health sector, the emerging TB/HIV epidemic, and information on the policy context of the South African situation are discussed. The background and context of the public-private mix suggest that the public sector in South Africa cannot effectively control TB epidemic without drawing on the private sector. One response is to find effective ways to manage rising TB caseloads through strengthened public-private partnerships in the provision of TB treatment.

Chapter 4 describes and justifies the case study approach and methods that were used for the study. Key concepts of relevance for this study arising from the literature review are presented in a theoretical framework by which different public-private partnership models for the provision of TB treatment can be evaluated. The research design including the choice of a case study approach, design of the case study, and choice of qualitative and quantitative methods is presented. Research process (i.e.

site selection, data collection methods, and data analysis) and more detailed methods specific for each objective of the study are explained separately in chapters 5 - 8.

Chapter 5 reviews the public-private mix in the provision of TB treatment in South Africa, focusing on the characteristics of different service providers. It identifies and defines the main providers of TB treatment and their roles and responsibilities to TB treatment. The chapter starts with an overview of the National TB Control Programme focusing on the public sector provision of TB treatment. It then goes on to discuss the nature of the private sector provision of TB treatment. Whilst the public sector is the main provider of TB treatment in South Africa, there are three major types of private providers that provide TB treatment (with or without public financing). The chapter ends by describing existing partnerships for directly observed TB treatment between the public and private sectors.

Two particular models of the partnerships reviewed in chapter 5 are chosen for further evaluation, and then compared with the public sector provision of TB treatment, which is the focus of chapters 6 and 7. Chapter 6 evaluates the performance, in terms of quality of care, of two different models of public-private partnerships for the provision of TB treatment. This includes findings on technical, process, and outcome quality. The ways in which the partnerships operate are also described. Chapter 7 evaluates the performance of the two public-private partnership models in terms of cost-effectiveness. It examines whether, in light of the TB/HIV epidemic, increased collaboration with private providers through partnerships could potentially improve cost-effectiveness of TB treatment. It also explores the role of the public sector financing in each of the models.

Whilst the findings in chapters 6 and 7 support the call for an increased role for private providers in the provision of TB treatment, previous experience and economic theory suggest that appropriate incentive mechanisms should be in place if partnerships are going to be efficient. Chapter 8 focuses on understanding motivations to consider actual and potential participation of public/private partners for the provision of TB treatment, and based on the motivations, incentive structures suitable for different current and potential providers. It also looks at obstacles to private provision of TB treatment.

Chapter 9 discusses findings of the study, and the strengths and weaknesses of the methods used. Findings highlighted by a comparison between the models, and incentive mechanisms attributable to different models of public-private partnership, are then discussed. This chapter also situates the findings of the study in a broader context of public-private partnership policy discussions in South Africa.

The concluding chapter reflects on what has been presented in the preceding 9 chapters and draws lessons from the theoretical and empirical information that have broader relevance for TB treatment. It presents major conclusions about each of the models reviewed, discusses the nature of generalisability of findings, and explains how they fill in the knowledge gaps identified in chapter 2. It makes recommendations on how policy-makers in South Africa could best approach a policy on the private sector involvement in TB treatment. Areas for future research are then outlined.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

For many low-and middle-income countries a dual TB/HIV epidemic has emerged. The latest UNAIDS *2004 Report on the Global AIDS Epidemic* indicates that an estimated 4.8 million people become infected with HIV in 2003, around 37.8 million adults and children were living with HIV/AIDS in 2003, and over 20 million have died since 1981. Approximately one-third of people living with HIV worldwide are co-infected with *Mycobacterium tuberculosis*, of whom 70% live in sub-Saharan Africa (UNAIDS, 2004). Tuberculosis is the leading cause of death among HIV-positive people, and HIV has been responsible for a global surge in the number of cases of active tuberculosis. It has been estimated that in 2000, around 8.2 million TB cases occurred worldwide, with the sub-Saharan African region having the highest incidence rates of about 300 per 100 000 population on average (Corbett et al., 2003). In the same year, around 1.8 million deaths occurred, with around 95% of those deaths in Asia and Africa (World Health Organisation, 2000a). About 13% of these people were also infected with HIV (Corbett et al., 2003).

Macroeconomic reforms and structural adjustment programmes, coupled with increased morbidity, mortality and disability due to the HIV/AIDS, tuberculosis and malaria epidemics, have led to health sector reforms in many developing countries. Health sector reform is concerned with "*defining priorities, refining policies and reforming the institutions through which those policies are implemented*" (Cassels, 1995). Within the context of health sector reform, the private sector is seen as a solution for many health system problems, ranging from inefficiency to poor quality services (Birdsall and James, 1992; World Bank, 1993; World Bank, 2003).

The primary economic rationale for introducing or expanding the role of the private sector in the health system, in instances where the public sector provides most health care, is the promotion of allocative and technical efficiency (Jackson and Price, 1994; Bennett et al., 1997; Turner and Hulme, 1997). The desired public-private mix is often assessed as a matter of balancing efficiency and equity considerations where the private sector is typically seen as being more efficient, and the public sector as more equitable (Rosenthal and Newbrander, 1996). In addition to creating incentives for technical efficiency, it is argued that there will be better allocative efficiency if the private sector provides care for certain groups because it will release resources for the public sector to provide services to the underserved (World Bank, 2003).

The private health sector in developing countries has grown considerably in the last few decades (Uplekar, 2000). Many Asian countries, accounting for over half of the global burden of TB, have large and growing private health sectors. While the need for government funding of major public health activities and government leadership in regulation remains widely accepted, there is also a need for better use of private providers who are supplying services of public health importance (World Bank, 1993; Mills et al., 2002).

The aim of this chapter is to review both the theoretical and empirical literature on the role of government in the health sector and the rationale for involving private providers in the delivery of public health services. It starts by reviewing economic theory on the need for government's intervention in health. It then looks at the private sector and public-private mix in developing countries. Public-private partnerships in health care, and more specifically for tuberculosis treatment, are discussed in the context of health sector reform. Economic theories of incentives and incentive mechanisms that can be used to encourage different private providers to collaborate with the public sector in the provision of public health services, and more specifically TB treatment, are then reviewed. The burden of tuberculosis is discussed. Lastly, gaps in the evidence-base on public-private mix in health and more specifically on public-private partnerships in the provision of TB treatment are highlighted.

2.2 Public-private mix and incentives

2.2.1 Arguments for government intervention: neo-classical economic theory

Neo-classical economic theory suggests that market failures explain the role of government (Akerlof, 1970; Rothschild and Stiglitz, 1976; Atkinson and Stiglitz, 1980; Greenwald and Stiglitz, 1986; Stiglitz, 2000; McPake et al., 2002). The market for health care is characterised by many failures that prevent consumers from allocating their resources efficiently, and, therefore, justifies government intervention (Arrow, 1963; Stiglitz, 1989; Donaldson and Gerard, 1993). These failures can be classified into four types: externalities and public goods, imperfect information, risk and uncertainty, and market structures.

Externalities and public goods are the most commonly cited aspects of market failure used to motivate government intervention (Arrow, 1963; Akerlof, 1970; Atkinson and Stern, 1974; Birdsall, 1989; Jack, 2000). Externalities occur when the behaviour of one party affects other parties but is not taken into account in market transactions. Certain forms of health care have positive externalities, implying that other people's consumption benefits our own welfare. The existence of an externality causes the market to fail because it prevents the individuals involved in the transaction from incorporating all of the social costs and benefits of their transaction (Hammer, 1997; Musgrove, 1999; Jack, 2001). This means that consumption of some goods (e.g. immunisation against disease and completion of curative therapy) that directly benefits a private decision-maker also provides benefits to others, but private individuals will underestimate societal benefits and this will lead to an underconsumption of TB treatment from a societal perspective. Governments can induce individuals to consume more by subsidising the price of the good (e.g. offering free anti-TB drugs) or by reducing costs associated with travel and waiting (Jack, 2000).

Public goods[1] are those goods whose consumption is non-rival - consumption by one person does not reduce its availability for consumption by others, and non-excludable – people cannot be excluded from benefiting (Stiglitz, 2000). In a competitive market, providers would not be able to make profit (or at least cover their costs) and would thus not produce the good. However, the number of purely public goods in health is small. For instance, although consumption of TB drugs and preventative measures might be in the public interest, and some aspects of TB

[1] Economic theory distinguishes between public goods and merit goods, the latter being defined as "private goods and services that are considered to be of such importance that they are financed and provided by the public sector in addition to the quantities produced and purchased in the market" (Musgrave 1959).

control have the attributes of global public health goods, they do not constitute public goods because of rival consumption (Jack, 2001).

Whilst insurance resolves some problems related to health care, insurance markets sometimes do not work efficiently because of imperfect information. Imperfect information between patients and providers can lead to the existence of supplier-induced demand, while the presence of uncertainty has contributed to the development of health insurance markets. There are two main ways in which health insurance causes market to fail: 'moral hazard' and 'adverse selection'. Moral hazard is reflected in excessive use of medical services by insured individual and it arises when consumers face zero prices at the time of use (Pauly, 1968; Zeckhouser, 1970; Pauly, 1986; Weisbrod, 1991). One of the ways of controlling moral hazard is by the introduction of co-payments (Strong and Waterson, 1987). Adverse selection refers to a process by which only the worst risks purchase private insurance, and arises where low-risk individuals are able to opt out of the risk pool (Akerlof, 1970; Rothschild and Stiglitz, 1976). Strategies to address the problems of adverse selection include regulation of the insurance market, for instance by introducing compulsory insurance (McPake et al., 2002). The private market does not provide insurance for many important risks that individuals face and, therefore, there is a good reason for public intervention (Musgrove, 1999; Jack, 2001). Publicly provided insurance is often defended both on equity and efficiency grounds, providing all citizens with protection and avoiding some of the market failures that characterise private insurance markets (Jack, 1999).

These attributes of health care also apply to TB treatment, and thus, there are potentially many causes of market failure in TB control activities. Jack (2001) argues that there are some strong reasons to favour public intervention due to the specific characteristics of tuberculosis. First, there are positive externalities associated with detection and treatment because of its infectious nature. Second, individuals may not be well informed about the need for diagnosis because the symptoms of TB are similar to those of other less serious health problems. Third, because of the long-term nature of TB treatment, treatment is often incomplete contributing to drug resistance and associated costs. Fourth, public intervention in TB detection and treatment could represent an anti-poverty approach to development, as the majority of TB patients are poor (Jack, 2001). Finally, tuberculosis treatment is often excluded from health insurance policies (Jack, 2000). The specific characteristics of TB and the non-existence of insurance for TB treatment lead to market failures in the detection and treatment that justify the role for the government to finance, but not necessarily provide TB treatment.

The severity of market failure will depend upon the specific features of the country and health care system under consideration (Jack, 2001). Some critical external factors that affect the severity of market failures include (Bennett at al., 1996): (a) the epidemiological profile within the country; (b) sophistication of care provided; (c) professional ethics and regulation; (d) organisation and development of the business sector; (e) education; (f) the media and civil society; and (g) social values. Thus, economic theory suggests that the appropriate roles for the government are context specific and depend upon a precise specification of the service under consideration. Furthermore, the existence of market failures alone does not justify total public financing and delivery of health care (Culyer et al., 1988; Bennett et al., 1996). Firstly, the range of market failures implies rather specific roles for governments, e.g. externality and public good characteristics imply public subsidy of services, as opposed to public production or public funding. Secondly, the characteristics of health care which give rise to market failures are also likely to cause government failures. For example, problems of asymmetric information equally enable public sector doctors to pursue their own interests rather than the welfare of the patient; they may have different incentives to private sector doctors but these are not necessarily better (Bennett et al., 1996; Jack, 1999).

It is recognised that the health sector does not meet the neo-classical conditions of a market under free competition (Bennett and Zwi, 1993; Bennett at al., 1997). The failures result in inefficiencies which may take any of three forms (Bennett at al., 1996):

- *demand inefficiencies* (i.e. incorrect consumption decisions due to consumer ignorance; insurance or free rider effect);
- *supply inefficiencies* (i.e. lack of incentives for provider efficiency in production; lack of a perfect agent for the patient; duplication of services);
- lack of attainment of a *social goal* (i.e. equity concerns about access and types of services available).

Government intervention occurs through financing of health services (i.e. provision of insurance, subsidies or vouchers); production of provision of health services; and/or subsidizing the purchase of productive factors (i.e. controlling the supply of health personnel through training or control of technology inputs). Although neo-classical economic theory provides guidance as to which generic roles government should perform (financing, provision, regulation, transfers), it appears unable to offer much of the understanding of the precise form this intervention should take. Externalities and public goods do not necessarily suggest extensive government provision of services; pure public goods are few and externalities may require only a limited degree of subsidisation (Bennett et al., 1997; Jack, 2001). While neo-classical economic theory suggests that governments should finance services that fall into category of public goods, such as vector control and immunisation (Musgrove, 1996), it also assumes that agents are perfectly informed. However, in reality this is rarely the case, and this is where new institutional economics challenges neo-classical economic theory.

2.2.2 New institutional economics perspective on the role of government

The problem of imperfect information between patient and provider is a key problem of the health care market (Arrow, 1963; Akerlof, 1970; Rothschild and Stiglitz, 1976; McPake et al., 2002). The theory of perfect competition assumes that consumers have perfect knowledge about the goods and services that they consume. In the health sector, however, there is an asymmetry of information between providers and patients. Patients are not in a position to diagnose their illness or to assess whether a prescribed treatment in necessary or appropriate. In is inefficient for each patient to seek all the relevant information and obtain 'second opinions'. Providers (such as doctors, pharmacists, dentists) therefore operate as agents for the patient and make decisions on the patient's consumption. This relationship between patient and provider is known as a principal-agent relationship, where the patient is the principal and the provider acts as the principal's agent (Pratt and Zeckhauser, 1985).

There are many reasons why health care providers may be imperfect agents. For example, they may wish to maintain a certain level of income (Bennett et al., 1997). If providers are paid on a fee-for-service basis, there is an incentive to over-provide services – such supplier-induced demand is facilitated by the asymmetry of information between health care providers and patients.

Many transactions within the health system involve a principal-agent relationship where a principal delegates responsibility to an agent to act on his/her behalf. For instance, there is an agency relationship between the Ministry of Health and a health authority. Regulatory agencies can be seen as agents to government. There is an agency relationship between a hospital manager and hospital employees. Economic theory suggests that problems are likely to arise in any principal-agent relationship as the agent is tempted to pursue his/her own goals at the expense of those of the principal (McPake et al., 2002).

Though the problems of principal-agent relationship are unavoidable in health care, creating appropriate incentives for agents and monitoring and sanctioning of agent behaviour are some of the ways for solving the market failure (Mills et al., 2001). Recognition of 'imperfect agency' gives policy makers important opportunities to influence the behaviour of health care providers (e.g. through different reimbursement methods). However, this may not always be straightforward as there sometimes there could be multiple principles for any one agent. For example, a physician may act as an agent for a patient, but at the same time may also be seen as an agent for hospital management, whose objectives may be different form those of the patient (e.g. cost containment). How different providers in the health care system are paid can have an impact on their behaviour, and therefore on the achievement of the objectives of the health system (efficiency, equity, cost containment). In addition, to ensure against inappropriate behaviour by agents, rules and sanctions are also needed (Bennett et al., 1997).

Neo-classical economics is criticised for its expectation of rational, maximising behaviour by all individuals and its failure to represent chronic information problems (Greenwald and Stiglitz, 1986; Stiglitz, 2000). New institutional economics argues that, given the complexities of health care, it is neither practical nor desirable for all agents to be perfectly informed (Hodgson, 1988; Hart, 1990), and institutional arrangements can help to reduce problems associated with asymmetric information (North, 1990). For example, professional organisations certify medical personnel and provide some guarantee of the quality of care which they will deliver (Mills et al., 2001).

North (1990) argues that problems of imperfect information create transaction costs, e.g. patients unsure of a physician's skills may seek a second opinion. New institutional economics assumes that high transaction costs are one more reason for a dominant government role in provision. According to Williamson (1985), the appropriate institutional form for producing and delivering a good or service depends on which form minimises costs. In a situation where information is expensive to acquire, transaction costs are high and market-based arrangements may be inappropriate (North, 1990). Under such circumstances it may be more efficient for the service to be produced and delivered by a bureaucratic organisation. However, for that organisation to operate efficiently, it is essential that the individuals within the organisation are faced with appropriate incentives (Handy, 1993; Preker and Harding, 1999; Le Grand, 2003). The new institutional economics theorists argue that private ownership, and the incentives associated with it, may stimulate competition and result in efficient service, and that the role of government is not necessarily one of direct service provision, but rather policy making (Hood, 1991; Russell et al., 1999).

Institutional approaches may also help to analyse issues of appropriate incentives and the motivation of individual actors within organisations. Many of the problems identified in public sector bureaucracies (e.g. lack of competition, inappropriate incentives) stem from institutional weaknesses (Bennett et al 1996). Cassels (1995) identifies three key principles important for institutional reform in the health sector, namely, strengthening of management and accountability, specification of priorities, objectives, standards and monitoring of outputs, outcomes and resources use, and clarification of institutional relationships.

In summary, new institutional economics suggests that institutional arrangements can help to reduce problems associated with imperfect information, provided that the individuals within the institutions are provided with appropriate incentives. It also suggests that high transaction costs, created by the problem of imperfect information, are one more reason for a dominant government role in provision.

2.2.3 Public-private mix in the health sector: an introduction to financing and provision functions

Health systems in developing countries have three main characteristics. First, health services have been traditionally regarded as a responsibility of the state. In Zimbabwe, for example, a strong state role in health has been rooted in the political ideology of socialism (Russell et al., 1997). In Sri Lanka, health care was perceived as a basic right for all citizens, and that was embodied in the constitution (Russell and Attenayake, 1997). Second, there is a strong bias towards curative and hospital services. Though the primary health care approach has been promoted, health systems in most countries are heavily hospital and curative care biased (Mills et al., 2001). In Zimbabwe, over 50 per cent of government health expenditure is allocated to hospitals, with its the majority going to central and general hospitals (Cripps, 1997). Finally, as the health care sector developed, various health sector constituencies also developed. For example, with the expansion of the government health care in Ghana, bureaucratic and professional constituencies have expanded (Smithson et al., 1997).

Development of health systems in developing countries has some common historical features. Organised health services were introduced by the colonial power to cater for the needs of the military, civil service and settler communities (Zwi and Mills, 1995). Given the prevalence of communicable disease (e.g. typhoid and tuberculosis) at the time, protecting expatriates meant that the health of the indigenous population had also to be addressed. This was actively promoted through churches and missions. In the post-colonial period, regimes of newly established countries introduced a policy where education and health care were available free of charge (Mills et al., 2001).

Health systems in developing countries are predominantly publicly financed and provided. Though the private sector financing and provision were not banned in the past, they were not encouraged either. In many countries, traditional health care practices operate alongside Western medicine. China, India and Zimbabwe are only some examples (Bennett and Muraleedharan, 1998; Russell et al., 1997; Uplekar, 2000). However, while is some countries, traditional practitioners are officially recognised as professionals who provide additional resources, they do not have the same status in other countries (Mills et al., 2001).

In the 1980s, the World Bank introduced structural adjustment programmes. The main policies included deregulating markets, shrinking the public sector, dismantling direct controls over trade and investment, and devaluing national currencies (World Bank, 1987). These policies had impacted upon the health system. For example, introduction of user fees led to declines in health services attendances, which had indirectly influenced health status (Russell and Gilson, 1997; Russell et al., 1997; Smithson et al., 1997). Global economic recession and reduction in foreign aid also had a major effect on health services.

While there is no universal package of measures that constitute health sector reform, overall goals of many countries are improving health care efficiency, equity and sustainability (Cassels, 1995). In developing countries, the aim of health sector reform is to strengthen the basic health services as well as to shift scarce resources to primary care and prevention (Cassels and Janovsky, 1995). The changed health systems have an impact on the design, financing and delivery of health care services.

In the early 1980s, the government, in many developing countries, was viewed as a primary player in the health sector. From the mid-1980s, international financial organisations, such as the World Bank, set a new policy agenda recommending a smaller role for government in health care and the promotion of the private sector (World Bank, 1987; 1993; 1997). Some of the assumptions upon which this recommendation was based were: (a) costs of health care are rising and government resources are scarce; (b) private health expenditure in most developing countries exceed government expenditure; (c) people tend to prefer private health care and pay for it rather than avail themselves of free public sector services; (d) the private sector is free from administrative and political constraints and therefore delivers health services efficiently; (e) increasing privatisation will free up scarce government resources which can be targeted to provide services for the poor; and, (f) infusion of market forces such as competition and incentives will lead to improvements in service quality (World Bank, 1993). The proposed expanded role for the private sector was argued primarily on ideological and theoretical grounds, with almost no reference to empirical evidence (Brugha and Zwi, 2002). Common criticism of these policies points to a lack of evidence on the validity of assumptions about cost and quality of services provided by private health care providers (Bennett, 1991; 1992; Bhat, 1993; Yesudian, 1994; Bennett et al., 1997; McPake, 1997; Swan and Zwi, 1997; Uplekar, 2000; Mills et al., 2001). In particular, the ability of users to judge the technical quality of the care that they receive for important public health problems such as sexually transmitted infections, TB and malaria has been questioned (Brugha and Zwi, 1998; Schneider et al., 2001; Uplekar, 2000). In addition, the issue of equity and workable mechanisms of selective targeting of select services for the poor are some of the overriding concerns (Bennett et al., 1997; Gilson, 1998; Mills, 1998; Chabikuli et al., 2002).

The health systems around the world broadly include various combinations of three basic systems (Bennett, 1991):

1) Public assistance, where governments provide medical care in large part through their own hospitals and health centres financed by general taxation;

2) Health insurance, provided often by governmental, non-governmental or a mix of institutions that cover the population partly or entirely; and,

3) National health service, which ensures free services with universal coverage.

There are many individual variations among different countries and more than one system can be found within a single country. In addition, there is no general rule on the extent to which the public sector should provide health care directly and where it should restrict its activities to financing it. The South African health system has a strong private sector but it serves less than 20% of the population and is financed through voluntary health insurance (only 16% of the population are members of these medical schemes) and out-of-pocket payments. The public sector serves the rest of the population and is funded primarily through taxation (McIntyre and Doherty, 2004). South Africa also has a long history of public-private interaction within the health system. Many uninsured South African pay out-of-pocket for primary care in the private sector (Cornell et al., 2001), partly due to inaccessibility of public services and also due to much higher quality of care offered by private doctors (Palmer, 1999; Schneider et al., 2001; Mills et al., 2004). On the other hand, less than 40% of the population uses private providers for acute care (Cornell et al., 2001) suggesting significant inadequacies in primary health care coverage.

The relationship between the public and private sectors with respect to service provision is traditionally viewed by economists in terms of two key functions, that of financing and provision (Donaldson and Gerard, 1993; Bennett at al., 1997) by which the responsibilities of the public and private sector are delineated. In terms of financing and provision, Mills et al (2001) suggest four main types of organisational arrangements that may exist between the public and private sectors:

1. Public financing and provision. Government both funds health care and adopts direct roles of service management and delivery. National health systems which provide services to the entire population and are financed from the central government budget exist in many countries.

2. Public financing and private provision. Government funds health care, but adopts an indirect role of service provision by arranging contracts or subsidising private providers in a more informal way. For example, contracting out – where a public hospital may purchase clinical (such as laboratory, dialysis or radiology) or non-clinical services (management advisory services, laundry, security, catering and paramedics and air ambulance services) from a private provider.

3. Private financing and public provision. Private agents including users finance health care services which are delivered by publicly owned agents. For example, leasing out public beds/wards for private patients, where private providers pay to use public facilities; or limited private practice, where public sector doctors are allowed to spend a specified number of hours in private practice.

4. Private financing and provision. The government role is confined to regulation and standard setting; services are both financed and provided by private sector agents. It includes privately owned facilities, private practitioners such as doctors, nurses, physiotherapists, traditional healers, and privately owned pharmacies.

Public financing and private provision, and private financing and public provision, are the arrangements that are referred to in the term the public-private mix within health care. They present a useful framework for understanding public-private partnerships with respect to financing and provision of health care services. The nature of these types of relationships often varies according to level of care, and the history of the interaction between the two sectors (Hanson and Berman, 1998). Most countries have a number of these public/private sector combinations in existence in their health systems. A combination of the first and the fourth arrangements are predominant in most developing countries (Mills et al., 2001). However, economic theory of the public-private mix is extremely scarce. In addition, evidence of public financing and private provision arrangements particularly in developing countries is limited.

2.2.4 Definition of the private sector

While the public sector is fairly homogenous, the private sector in health is very complex and includes all those health care providers working outside the direct control of the state. The definition therefore includes (Bennett, 1991):

a) Non-profit organisations (non-governmental organisation, and mission or church related facilities)

b) For-profit individuals in group or solo practice (both allopathic and traditional);

c) More complex for-profit multi-institutional forms such as Health Maintenance Organisations; and,

d) For-profit commercial interests.

Providers may be individual practitioners, groups of practitioners, or facilities (e.g. clinics, hospitals, or other institutions). A general typology of health care providers includes doctors, paramedical health workers (such as physiotherapists), nurses, pharmacies (who play an important role as providers of over-the-counter and prescription drugs, and in giving medical advice), and traditional doctors or other healers (Brugha and Hanson, 2000; Mills et al., 2001). The private arrangements can also differ in terms of whether the services provided rely on traditional medicine, and whether they provide ambulatory or inpatient care (Berman, 2000).

In many developing countries there is a long tradition of service delivery outside of government, with a low involvement of the formal private-for-profit sector and more substantial involvement of the not-for-profit[2] sector. Most African countries have a strong presence of non-profit private providers such as church health facilities, major providers of services in rural areas. The mission sector is the largest part of the non-profit sector in Africa whose activities mainly originated in colonial and pre-colonial

[2] Non-profit does not imply that non-profit organisations do not make profits but that any profits or surpluses that they make are not distributed to shareholders. They are instead retained and reinvested in the business (Rose-Ackerman, 1996).

times. However, it was only in the 1990s that non-governmental organisations (NGOs) were recognised to have a significant role in the health sector (World Bank, 1993). The NGO sector is very diversified in terms of size, means of and access to finance, control, motivation and roles. Their involvement in health care ranges from social transformation and advocacy to more specific aspects of service delivery. Green and Matthias (1995) subdivide NGOs activities as service providers into: (a) mainstream service delivery; (b) special disease programmes; (c) emergency and relief services; (d) pilot projects/research; (e) support to other NGOs; and, (f) training. The informal health sector is also present in many developing countries.

Many private for-profit service providers are present in low- and middle-income countries in South Asia and Africa. In India, for example, the private medical sector accounts for about 80% of doctors of modern medicine and 60% of hospitals (Ogden et al., 1999a). In Zimbabwe, 66% of doctors work in the private sector (Bennett et al., 1997). In these countries, private provision and expenditure is concentrated at lower levels of the system. In countries with higher levels of gross domestic product (GDP) per capita, the private sector usually incorporates an insurance sector. In South Africa, where 72% of doctors, 75% of specialists, 48% of hospitals and 25% hospital beds are provided by the private sector, the expenditure, which pays for these services, is channelled through 'medical aid schemes' (Price et al., 1993; van Rensburg and van Rensburg, 1999). The private sector in South Africa plays an important role in secondary and tertiary level provision.

It is conventional to define private providers as those who fall outside the direct control of government (Bennett, 1991; Smith et al., 2001). However, there are a number of grey areas that are inadequately described by this definition. For example, NGOs may receive a considerable proportion of their funding from government, blurring the distinction between public and private where conditions are attached to these funds. In Ghana and Zimbabwe, governments provide substantial subsidies to church providers (Mills et al., 2001). Measurement of private activity is further complicated by the fact that much private sector activity takes place within the public sector (e.g. private practice by government physicians, or fee-paying beds in public sector hospitals). Numerous studies in developing countries have shown that private provision of services account for a large share of health care delivery (Birdsall and James, 1992; Griffin and Paqueo, 1993; Uplekar and George, 1993; Hanson and Berman, 1998; Berman, 2000; Cornell et al., 2001). Private health care providers are used by both middle and low income groups (Berman, 1996).

Evidence suggests that the private sector primarily focuses on the provision of acute curative services, and that private practitioners' provision of public health services is very limited (Bennett et al., 1997; Hanson and Berman, 1998). However, private practitioners are often a dominant source of intervention for many public health conditions like malaria, TB, sexually-transmitted infections (STIs), diarrhoea and respiratory infections (Berman, 1996; Musgrove, 1996; Swan and Zwi, 1997; Brugha and Zwi, 1998; Berman, 2000). The main reasons for consulting private sector providers are: (1) better geographical accessibility, shorter waiting time, longer or more flexible opening hours; (2) greater availability of staff and drugs; (3) greater confidentiality in dealing with diseases such as TB, STIs, which carry social stigma; (4) perception that private service providers are more considerate, caring and sensitive to client concerns; (5) perception, in some settings, that private services are technically superior; and, (6) continuity of care (Aljunid, 1995; Swan and Zwi, 1997; Uplekar et al., 1998; Lonnroth, 2000; Schneider et al., 2001).

2.2.5 Public-private partnerships in the health sector

Increasingly, public-private partnerships (PPPs) in many countries are considered an important mechanism for solving complex social and health problems (Kolehmainen, 1999). The increased importance of this kind of partnership is related to many factors, including changes in international economic priorities and the effect of these changes on local and national policies, health sector reform, and increasing pressures on health resources (Management Sciences for Health, 1999). Public-private partnership is a formal or informal collaboration among two or more organisations engaged in a joint initiative to achieve common objectives (Ridley, 2001). At least one partner is from the public sector, and at least one is from the private sector.

A large variety of global public-private partnerships, combining the skills and resources of a wide range of collaborators, have arisen for product development, disease control through product donation and distribution, or the general strengthening or coordination of health services (Widdus, 2001). The typology of PPPs includes (Buse and Walt, 2001b):

(a) *product-based partnerships* (e.g. Mectizan Donation Programme, Malarone Donation Programme, Zithromax Donation Programme)

(b) *product-development partnerships* (e.g. The Global Alliance for TB Drug Development, the International AIDS Vaccine Initiative, Medicines for Malaria Venture)

(c) *systems/issues-based partnerships* (e.g. Bill and Melinda Gates Children's Vaccine Program; Global Programme to Eliminate Filiariasis; Secure the Future).

At national level, there are numerous examples of PPPs in operation in health sector. In Taiwan, private physicians are contracted to provide sterilisation and IUD insertion (Foreit, 1992). In Costa Rica, the contracting out of a broader range of public health services has been attempted (Pezza and Bolanos, 1994). In South Africa, several reformed health plans have been implemented with partnerships being formed amongst public hospitals, factories and groups of doctors (Goudge et al., 2001). Other two examples of PPP initiatives in South Africa are:

- An unused public hospital ward is designated for private sector patients of an independent practitioners association in return for reasonable payment and contribution of free sessions at community clinics by the GPs (or funding an account dedicated to the maintenance and upgrading of the public facility as a whole, according to the plan approved by hospital management) (Management Sciences for Health, 1998).
- Leasing out vacant space in an academic hospital to a private hospital group (a private wing attached to the academic hospital) (Cleary and Thomas, 2002).

Public-private partnerships at a national level range from small-scale contracting out of one or two service components to large-scale sharing of health care provision and financing. However, they should be distinguished from the trend to privatisation (i.e. the private for-profit sector provision of health services), where the public health policy goal and the rules under which for-profit entities operate are set and enforced solely by government agencies (Widdus, 2001).

Reasons for embarking on health partnerships at both global and national levels are many: shifting ideologies and trends in globalisation have highlighted the need for closer global governance; a desire on the part of the private sector to be part of global regulatory decision-making processes; and, searching for 'win-win' interactions in an increasingly interdependent world (Buse and Walt, 2001a). However, public-private partnerships in health at a national level are still very rare and most of those that exist are small scale.

Giusti et al (1997) argue that partnerships can help supplement government health care services by ensuring access to services in regions or for groups that the government cannot adequately cover. Some of the many benefits of public-private partnerships include:

- An increased number of people receiving health care services;
- Redirection of scarce public resources to provide essential health care needs;
- Combination of public and private resources to increase the resource base;
- A source of additional revenue for private sector entities;
- Improved efficiency and management in health care delivery;
- Structural improvement through new investments; and,
- Improved technical competence through training and capacity building efforts.

Criticisms of partnerships have also been made. One critic of PPPs argues that the private sector has several mechanisms for maximising profits which may be in conflict with the goal of better health (Hancock, 1998). Among these is the reduction of costs by paying low wages and reducing the size of the workforce, thereby making people poorer. Buse and Walt (2001a) argue that public and private sectors are driven by differing ethos and principles.

Literature is beginning to emerge on lessons learned on the 'effectiveness' of global health partnerships (Frost and Reich, 1998; Ridley et al., 1999; Widdus and Evans, 1999). However, very little is known about how effective PPPs are at national level.

2.2.6 Involving private providers in the provision of TB treatment

As discussed earlier in this chapter, due to the specific characteristics of TB treatment which causes market for TB treatment to fail, the government in many developing countries has a dominant role in TB control (Jack 2001). In high-burden countries, the focus of activities aimed at strengthening National Tuberculosis Programmes (NTPs) has been on the general health services. However, due to an increasing TB burden, related particularly to the global HIV pandemic, it seems unrealistic to rely only on existing government services to improve TB control. In addition, in order to retain confidentiality, patients co-infected with TB and HIV are likely to use private providers (Newall, 2002).

In sub-Saharan Africa, there is an increasing interest in enhancing the contribution of communities to effective ambulatory TB, as part of national TB programme activities (Maher et al., 1999; Maher, 2003). Several published studies show good results with community contribution to TB care in various settings (Mushtaque et al., 1997; Wilkinson, 1997; Malla et al., 1997; Dudley et al., 2003). A number of cost-effectiveness studies performed as a part of the 'Community TB Care in Africa' project demonstrate that community contribution to TB care can be cost-effective in various African settings (Floyd et al., 2003; Moalosi et al., 2003; Nganda et al., 2003; Okello et al., 2003; Sinanovic et al., 2003). However, data on the quality of care provided through different approaches to community-based TB care is lacking.

There are some initiatives that are trying to build a public-private mix in the provision of TB treatment in Asia (WHO, 2001b). A unique public-private partnership project in Hyderabad City in India demonstrated that it is possible to involve the private sector for the purposes of TB diagnosis and treatment (Murthy et al., 2001). This PPP model was established on a pilot basis, with collaborative efforts between private practitioners and the government, through an intermediary organisation (a non-profit hospital). In their study, Murthy et al (2001) conclude that the PPP can achieve moderate to high rates of case detection and high rates of treatment success. The public-private services also appeared to be more convenient to patients.

Another example of public-private mix models in the provision of TB treatment in India involves local NGOs to increase case finding and improve access to direct observation of treatment (Rangan et al., 2003). In the Philippines, a public-private mix model in the provision of directly-observed TB treatment, in which the private clinics provide the space, staff and operational funds and the public sector provides technical assistance, anti-TB drugs, laboratory supplies and forms, was developed. Evaluation of the model showed treatment success over 80% (Mantala, 2003). A public-private mix project in Vietnam, where private practitioners diagnose and treat TB patients according to the NTP guidelines and the NTP provides training, supply forms and monitors the collaboration, shows that formal collaboration with private practitioners can substantially increase case detection (Quy et al., 2003a) and improve treatment outcome (Quy et al., 2003b). In Kenya, an NGO provides a subsidy on drugs to private hospitals and physicians who in turn follow NTP guidelines, notify cases, assist in defaulter retrieval and maintain and submit records (World Health Organisation, 2001b). Preliminary results of this intervention show 84% success rate (World Health Organisation, 2001b).

The various ways in which the public sector can collaborate with the private health sector are described above. The majority of the reviewed studies show that most public-private mix models depend to some degree upon public financing, mostly in-kind such as supply of drugs or training. All public-private mix models envisage an agency that communicates with private practitioners, and is responsible for looking after the 'public health' elements in provision of TB care, such as ensuring quality microscopy, regular drug supply, patient support services, absentee retrieval, and recording and reporting (World Health Organisation, 2001b). Whilst there is empirical evidence on the quality of care provided through public-private partnerships for the provision of TB treatment in Asia, evidence on public-private partnerships, and the quality of care provided through different partnerships, in Africa is limited. In addition, most of the existing initiatives to include private providers are small scale.

Potential problems with expanding private sector development have also been recognised. For example, problems associated with under provision of services for which no profit can be made, or concentration of private-for-profit providers in urban areas, have been reported (Bennett, 1991; Bennett et al., 1997). Bennett et al

(1994) suggest five main problems associated with private-for-profit provision: (1) the main objective is profit-maximization; (2) failure to address public health; (3) lack of integration with government health services; (4) attraction of professionals out of the public sector; and (5) provision of poor quality or inappropriate services. They suggest that due to different objectives between the government and private providers, and the problems of agency relationship (in this case a principal is the state and the agent is private provider), mechanisms like regulation, advocacy, incentives and monitoring systems must be in place. The following section looks at economic theory of incentives and empirical evidence on the use of incentives in health care and more specifically tuberculosis treatment.

2.2.7 Theory of incentives and incentive mechanisms for the private sector participation

Economic theory suggests that problems are likely to arise in any principal-agent relationship as the agent is tempted to pursue his/her own goals at the expense of those of the principal (Arrow, 1963; Akerlof, 1970; Rothschild and Stiglitz, 1976; Greenwald and Stiglitz, 1986; Laffont and Martimort, 2002). The transition from public to public-private sector treatment of TB raises a range of issues related to incentives and structuring relationships to achieve desirable outcomes. What do we mean by incentives? For economists, the nature of incentives is the driving rationale behind observed market behaviour. Economic incentives are defined as *"allowing individuals to behave in accordance with expected material rewards or favours that can be traded for such rewards including leisure"* (McPake et al., 2002). This can be contrasted to social norms where people behave in accordance with social rewards such as approval or disapproval of others (Lindbeck, 1997).

Originally developed in the context of a firm and employee, the economic theory of incentives uses the context of agency relationships as its basis: *"wherever there is an agency relationship, there is a set of incentives through which the principal aims to direct the agent to act on her behalf"* (McPake et al., 2002). Essentially because of information problems, the behaviour of the agent (e.g. private sector provider) can, through some hidden action, lead to a sub-optimal allocation (e.g. lower quality). The solution to the problem (e.g. how to affect the behaviour of the agent so that desired outcomes are reached) results in different incentive designs dependent on observed outcomes.

In the case where outcomes are difficult to observe, then the solution to the problem depends on whether the parties are willing to bear risk. Within this context, the incentives must be structured so as to allow for managers or individuals to be willing to participate in the firm (the participation constraint). Second, the incentives are structured in such a way as to allow for a greater return if there is higher effort than the return to the manager for a lower effort (the incentive-compatibility constraint). Thus the resulting mechanisms relate rewards to different observed outcomes (Kumaranayake, 1998; McPake et al., 2002).

Incentives could be either managed or regulated. Due to informational, transaction, administrative and political constraints to achieving desired objectives, there has been a great interest in finding out whether incentive management is not a better way of achieving the objectives of regulation. Whilst incentive management attempts to manage an individual's behaviour, incentive regulation adopts market-based criteria.

For example, incentive regulation scheme can be 'rules' which regulate verifiable outcomes such as price (Laffont and Tirole, 1993; Laffont and Martimort, 2002). In a study that looked at whether monetary incentives can improve the access and health of Medicaid residents in nursing homes while saving money, Norton (1992) found that the incentive regulation had beneficial effects on access, quality and costs of care. The study showed that incentive mechanisms could have much lower transaction costs associated with them. However, it also suggested that monitoring is still important.

Incentive management may take two forms McPake et al (2002):

(1) the government can subsidise or tax regulated firms. Transfers can take several forms: direct subsidies (a lump sum payment or a 'price subsidy'), government loans at low interest or government guarantees for borrowing on the private markets, and transfers of public input. (Laffont and Tirole, 1993).

(2) the government can make transfers to firms through its purchasing function. This is also a subsidy but is associated with a greater explicitness of contractual arrangements. For instance, in the UK, contractual arrangements between health authorities and hospitals have been classified as 'block' (equivalent to fixed rate subsidies), 'cost-per-case' (equivalent to price subsidies) and 'cost and volume' (where a specific price-quantity point is agreed). Examples of incentive management practices in developing countries come from Malaysia and Thailand where allowances paid to encourage physicians to forgo private practice represent a form of subsidy to the services provided by those physicians.

Governments have a range of incentive options for influencing providers' behaviour in ways consistent with their national health sector goals. Bennett and Zwi (1993) list a number of incentive mechanisms that can be used to encourage private for-profit providers to collaborate with the public sector. They include: (1) providing free or subsidised continuing education for private practitioners (has positive quality effects); (2) free provision of supplies such as vaccines, condoms and other contraceptives to private practitioners to encourage them to provide preventative services; (3) supporting the development of the private sector by providing access to drugs and other medical supplies at state tender prices or by exempting these supplies from customs duties when they are purchased directly by the private sector; (4) government financing of certain privately provided services (contracting out services); (5) capitation reimbursement (in preference to fee-for-service) to promote efficient provider behaviour; and, (6) committees to facilitate public and private sector co-operation. These incentive mechanisms are also used to encourage co-operation between the non-profit and public sectors. Additional incentive and collaboration mechanisms that are applied to the NGO sector include (Bennett and Zwi, 1993): (a) lump sum annual subsidies (sometime called subventions); (b) payment of NGO staff salaries; (c) secondment of public health personnel to work in NGO facilities and projects; and, (d) payment of retirement benefits.

The possibility of utilising incentives as a means of improving the control and management of TB has received particular attention internationally (World Health Organisation 1994). Some of the examples of incentives/subsidies for TB control include: (a) inviting representatives of private practitioners to participate in planning TB control activities; (b) involving private practitioners in case-finding activities by providing incentives for reporting and contact tracing; (c) providing free diagnostic services and drugs, as well as monitoring and outcome evaluation, to patients of those private practitioners agreeing to supervise them according to national TB guidelines; and, (d) providing the services of support staff such as social workers for patient health education and defaulter tracing. Accreditation and franchising have been suggested as effective incentives to promote quality of TB treatment in the private sector (Brugha and Zwi, 1999; World Health Organisation, 2003b).

The literature on response to incentives by health care providers observes the broad distinction between financial and non-financial motivation or incentive response (see Table 2.1 overleaf). Studies on the general practitioners' contracts in the United Kingdom highlight the influences on the effectiveness of a pure financial incentive, including the level of incentive, the identity of the provider, and socio-economic factors relating to the community in question (Lynch 1994; Hughes and Yule 1992). Preker and Harding (1999) argue that certain environmental factors, such as governance, market environment, and the payment mechanism, and personal factors (e.g. altruism or social responsibility) can weaken the influence of financial incentives. However, motivating individuals is complex, and theories of organisational behaviour have not come up with one generally applicable theory of how incentives operate (Handy, 1993).

Table 2.1: Policy options for influencing provider incentives and behaviour

Financial incentives
Capital markets
• Provide government loans at low interest
• Provide government guarantees for borrowing on private markets
• Improve access to low-cost credit and simplified loan application processes
• Provide access to foreign currency
Taxes and tariffs
• Introduce tax waivers, exemptions, and deductibles
• Provide favourable tariffs and duty-free imports of medical equipment and supplies
Other subsidies
• Give direct government subsidies targeted to public health objectives
• Provide government grants targeted to public health objectives
Provider payment
• Selective contracting
• Ensure appropriate provider payment mechanisms
• Assure reasonable profit margins (if prices are controlled by the government)
• Pay government obligations to providers in a timely manner
• Protect overdrafts in response to government payment delays
• Give bonuses to serve in underserved areas
Non-financial incentives
Regulatory environment
• Improve ease of entry to the market
• Improve regulatory processes and reduce bureaucratic controls
• Disseminate information on regulation and laws
Market and business environment
• Purchase selectively
• Grant access to use government facilities and equipment
• Provide consumer and market information
• Support development of an adequately skilled work force
Human resource development
• Open training and professional development opportunities to private participants
• Improve career path for private specialties that are in short supply
Public-private sector relations
• Assure clarity and predictability of performance expectations
• Promote public and private sector provider dialogue
• Formal partnerships where appropriate (e.g. engage private providers in public health programmes
• Enable referral across public and private providers

Source: Harding and Preker (2003)

Le Grand (2003) identifies two possible forms of motivation: the first type would principally respond to financial incentives and is self interested, whilst the second assumes that people are predominantly public-spirited or altruistic. Policies constructed on one set of assumptions would be markedly different from those constructed on the other. Whilst profit making firms or individuals will be largely influenced by financial incentives, it is not known what incentives are most important for a non-profit making firm or individual, as very little is known about the motivation of any of these types of providers, especially in developing countries (Robinson, 1997). In her study on the motivations of public and private managers, Steele (1999) found that altruistic motivations existed in the public sector and that they were more pronounced than in the private sector. Whilst providing a service to the community was the most important goal of public sector managers, improving the financial performance of the organisation and achieving organisational targets were the main goals of private sector managers. However, there has been a shift in beliefs about the motivations of those involved in the public sector which has led to policy makers to use market incentives to ensure that the service is provided efficiently (Le Grand, 2003).

Both incentive management and incentive regulation can be implemented through contractual arrangements. When designing contracts and restructuring incentives, there are two important constraints: *the participation constraint* – each person is willing to participate, and *the incentive compatibility constraint* – the contract needs to structure incentives in order to meet the desired objectives (McPake et al., 2002). However, in the health sector, there are many problems associated with restructuring incentive and designing contracts. For instance, the payer organisation may not be able to exactly verify what treatments have been administered to each patient. There may also be difficulties in verifying the symptoms of disease and the appropriateness of diagnosis recorded. Finally, since health outcomes are not easily observable by third party payers, contract reimbursement is almost never linked to health outcome.

Although it is desirable that contracts have such incentives, it is rarely the case, mainly because health outcome is not primarily dependent on health service inputs (Forsberg et al, 2001; McPake et al., 2002).

Arguments in favour of the use of market incentives, and especially contracts, in publicly financed health services are often couched in terms of potential gains to efficiency. It is argued first that increased provider competition will increase technical efficiency on the supply side, second that contractual relationships enhance efficiency via the incentive structure of the contract, and third that the contracting process itself promotes transparency in trading and the decentralisation of management responsibility, which will again have beneficial effects in terms of efficiency (Broomberg, 1994). There is an assumption that contracts will be adequately specified and monitored, allowing such tasks to be fulfilled. However, research (McPake and Banda, 1994; Broomberg, 1997; Palmer, 2000; Palmer et al., 2003) has highlighted that this may not always be the case, and poor contract design or insufficient capacity to monitor may be a feature of many contracted out services. In some cases this may result in the poor operation of these services, in others it may be less important. Hence the spotlight is shifting from the desirability of contracts *per se* to issues of contract design and the nature and influences upon a range of contractual relationships.

Contracts can be formal/explicit (written and formally binding agreements) and informal/implicit (McPake et al., 2002). The movement from classical to neo-classical to relational contracts described by McNeil (1974) resembles the movement from explicit to informal contracts. Recognition of the likely incompleteness of contracts begs the question on what other forces are at play determining the behaviour of parties in an incompletely defined contractual transaction. Behaviour within some contracts may be determined as much by factors external as internal. Institutional economics emphasises the importance of the role of both institutional and environmental factors and individual beliefs and motivations in shaping the way that contracts operate.

Effective monitoring of contracts is the major question in the health contracting literature. Due to bounded rationality and opportunism 'classical contracts' are not only difficult to attempt but also inefficient to monitor (Williamson 1975). Bounded rationality arises because *"the capacity of the human mind for formulating and solving complex problems is very small compared with the size of the problems whose solution is required for objectively rational behaviour in the real world"* (Simon 1961). Providers can act opportunistically ex-ante in the development of monitoring mechanism, and ex-post in their response to the monitoring mechanisms imposed (McPake et al., 2002). Since effective monitoring could be a very costly activity, the question to be addressed is, therefore, the type of contract and the degree of monitoring that is most likely to minimise transaction costs.

It is argued that trust can reduce transaction costs associated with contracting (Deakin and Wilkinson, 1995; Newman, 1998; Moore, 1999). The concept of trust is increasingly seen as playing an essential role in underpinning efficient contractual relationships, reducing the need for complex and expensive information and monitoring inherent in principal-agent relationships (Arrow 1973; Deakin and Wilkinson 1995; Goddard and Mannion 1998). In her article on trust and the development of health care as a social institution, Gilson (2003) suggests that trust may enable interactions between the public and private health sectors to function effectively, and that "*...the state should not be seen as just a provider, funder, manager or regulator of health services. Rather, in relation to health care, its central role is to manage the processes through which the meaning of the health system to society, and so its contribution to broader societal value, is established.*"

There is an increasing interest in selective contracting with the private sector for the delivery of health services in developing countries, although there is considerable debate over the cost and quality of care which they deliver (Yesudian, 1994; McPake, 1997; Swan and Zwi, 1997; Schneider et al., 2001; Chabikuli et al., 2002; Mills et al., 2004). The principal evidence relating to contracting in developing countries comes from a project on the extent and nature of clinical and non-clinical contracting (Alvarez et al., 1995; McPake and Hongoro, 1995; Beracochea, 1997; Bhatia and Mills, 1997; Broomberg et al., 1997; Gilson et al., 1997; Tangcharoensathien et al., 1997), and a study on the performance of different models of primary care provision in Southern Africa (Mills et al., 2003). The available evidence indicates that while private contractors may be able to deliver services at a lower cost than the public sector, when their profit margin is included the cost to the public sector may be higher or comparable to direct public provision (Mills, 1997). Quality of care may be similar to that in the public sector, but there is growing evidence that while private providers often have superior quality in relation to cleanliness and maintenance of facilities and sometimes in aspects such as staff friendliness, they also frequently have lower technical quality of care. In most of the cases, except in the study by Mills et al (2003), the extent of contracting with the commercial sector and for clinical services was found to be limited. With respect to NGOs, there have been positive evaluations of service delivery under contracts with NGOs to deliver district health services in Cambodia (Souters and Griffiths, 2003), and to deliver preventive services in several Latin American countries (Abramson, 1999). However there is little evidence on contracting out primary care specifically, and questions have been raised about the ability of contracts to control the delivery of such broad services in remote rural areas (Palmer and Mills, 2003).

South Africa provides a series of interesting examples of contracts for health care, both at the primary level and for hospital care (Broomberg, 1997; Palmer, 2001). Contracts between the state and private firms have been used extensively for many years to provide long-stay hospital care, on a limited scale for district hospital care, and extensively for non-clinical hospital services such as catering and security at hospitals. Contracts for primary care are more limited and mainly represent the part-time district surgeon service.

2.3 Tuberculosis treatment and the private sector

2.3.1 TB/HIV epidemic

Tuberculosis is one of the oldest diseases known[3] and yet remains a major health problem in developing countries. Rates of TB have been falling in industrialised countries throughout much of the 20th century. This decline is associated with improvements in socio-economic conditions (Porter, 1991). In addition to improved housing and nutrition, the introduction of effective anti-tuberculosis chemotherapy

[3] Dr. Robert Koch discovered Mycobacterium Bacillus in 1882 when TB was very prevalent.

contributed to the decline in TB rates in the decades following 1940. In spite of these advances, TB has continued to be a major infectious disease threat internationally and developing countries have continued to be burdened with large numbers of TB cases. The 1980s and 1990s have seen resurgence in international interest in TB due to increasing numbers of cases associated with HIV infection and an increasing problem of drug resistance.

Due to infection by *Mycobacterium tuberculosis*, TB is usually defined as a respiratory disease, although extra-pulmonary TB (e.g. miliary, skeletal, meningeal, gastro-intestinal) also occur, particularly in children, immigrants from countries where tuberculosis is more common and in people with impaired immunity. Tuberculosis is spread by airborne droplet nuclei that contain *M tuberculosis*. Active disease occurs when the host immune response cannot contain the replication of *M tuberculosis* associated with initial infection. Whilst other medical conditions, such as poorly controlled diabetes mellitus, malnutrition and deficiency of vitamin D or A (Willkinson et al., 2000; Karyadi et al., 2002), can compromise the immune system and predispose to development of active disease, HIV is greatest single risk factor for progression to active disease in adults.

Tuberculosis is the second commonest cause of death from infectious disease, after HIV/AIDS (Frieden et al., 2003). Mortality rates were between 50% and 60% before chemotherapy became available. In the developing world, TB accounts for 7% of all deaths and 26% of avoidable adult deaths (World Health Organisation, 2001a). In 2000, twenty-two countries were responsible for 80% of the global TB burden (Raviglione, 2003). Although TB affects nearly all age groups, the greatest burden of

TB incidence and mortality is concentrated in adults aged 5-59 years. In 2000, there were an estimated 8.3 million new tuberculosis cases, up from 8.0 million in 1997 (World Health Organisation, 2001b, Corbett et al., 2003). The rise is mainly due to a 20% increase in incidence in African countries most affected by the HIV/AIDS epidemic.

Besides being a serious public health problem, TB causes a particularly enormous burden to societies and economies in the developing world. However, the social and cultural factors that affect treatment behaviour and compliance have been inadequately studied. Tuberculosis is a disease that affects the most vulnerable and marginalized populations in all countries... *"the context of tuberculosis is one of social and economic deprivation and marginalisation"* (Ogden et al., 1999a). In developing countries, TB is the third most common cause of morbidity and mortality combined amongst women aged 15-44 years (Diwan and Thorson, 1999). Literature on gender[4] and tuberculosis suggests that the stigma associated with tuberculosis seems to have a greater impact on women than on men (Diwan and Thorson, 1999). Since 70% of the world's poor are women who face the greatest obstacles to seeking care and getting successful tuberculosis treatment (Diwan and Thorson, 1999), gender differences may, therefore, influence rates of compliance.

In the developing world, tuberculosis has always been a major public health problem, but the last decade has seen rising numbers of TB cases due to TB-HIV co-infection. In 2000, an estimated 11% of new adult tuberculosis cases worldwide

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[4] "Gender refers not only to the physiological differences between sexes but also to the variety of behaviours, expectations, and roles that exist within a social, economic, and cultural context" (Diwan and Thorson, 1999).

were infected with HIV (Corbett et al., 2003). Tuberculosis is the commonest HIV-related disease in the developing world (Elliott and Hawken, 1997; Godfrey-Faussett and Ayles, 2003, Corbett et al., 2003). Around 11 million people are co-infected worldwide, with a large majority in sub-Saharan Africa (World Health Organisation, 2000b). It is expected that by 2020, TB and HIV infection together will account for 92% of adult deaths from infectious diseases and that HIV infection as a risk factor will account for 25% of the TB burden (World Health Organisation, 2000b). Rates among HIV infection among TB patients exceed 60% in countries like Botswana, South Africa, Zambia, and Zimbabwe (Corbett et al., 2002). It is estimated that tuberculosis occurs in 40-60% of the HIV-infected (World Health Organisation, 2000b).

Several studies have indicated that active TB can cause progression of HIV disease and that HIV-infected patients with TB have a shorter survival and a higher tendency to acquire new opportunistic infections than an HIV-infected person who has not have TB, even when matched by HIV disease stage (Braun et al., 1991; Whalen et al., 1995). The extraordinarily high rate of co-infection with TB and HIV in developing countries has led to significant morbidity and mortality (Lucas et al., 1993; Murray and Lopez, 1997; Dye et al., 1999; World Health Organisation, 2002a), and proved to be a problem with enormous public-health consequences (Raviglione et al., 1992; Harries et al., 2001; Raviglione, 2003). In high HIV prevalence countries TB is a leading cause of morbidity and mortality (De Cock, 1992; Murray and Lopez, 1997; Harries et al., 2001). HIV promotes progression to active TB in both people with recently acquired (Di Perri, 1993; UNAIDS, 2002) and with latent *Mycobacterium tuberculosis* infections (Raviglione et al., 1992;

Elliott and Hawken, 1997; Sonnenberg et al., 2001). In the developing world, TB accounts for 7% of all deaths and 26% of avoidable adult deaths (World Health Organisation, 2001a). In 2000, twenty-two countries were responsible for 80% of the global TB burden (Raviglione, 2003).

2.3.2 Tuberculosis control

The overall objective of any TB control programme is to reduce mortality, morbidity and the transmission of the disease. The key to effective prevention and control of TB is the detection and cure of infectious, particularly smear-positive cases of pulmonary TB. The main components of a TB control programme are detection and treatment of TB, and prevention of TB thorough BCG vaccination and chemoprophylaxis.

HIV-related TB cases are an additional burden on the already scarce resources in developing countries, in particular in sub-Saharan Africa where the epidemic is the highest. A study in a rural South African hospital showed that in the period 1991-1998, total district hospital admissions increased by 81% and adult TB ward admissions increased by 360% (Floyd et al., 1999). Negative implications that HIV epidemic has on a TB control programme and its resource requirements have not been documented on a country-level.

Although economic studies have been undertaken on a variety of TB control topics, they have tended to be cost and cost-effectiveness analyses. In high-burden countries, cost studies have analysed total or per patient diagnostic and treatment costs from the perspective of health service providers (Barnum, 1986; Anand et al., 1995; Dick and Henchie, 1998; Wyss et al., 2001) and patients and/or households (Croft and Croft, 1998; Schoeman and Dick, 1998; Kamolratankul et al., 1999; Wyss et al., 2001). The most commonly studied topics in cost-effectiveness studies in high-burden countries have been the use of community-based care (Islam et al., 2002; Floyd et al., 2003; Moalosi et al., 2003; Nganda et al., 2003; Okello et al., 2003; Sinanovic et al., 2003), followed by evaluation of alternative approaches to delivery of short-course chemotherapy (Saunderson, 1995; Floyd et al., 1997; Wilkinson et al., 1997; Xu et al., 2000; Khan et al., 2002) and comparison of short-course and standard chemotherapy (Joesoef et al., 1989; Murray et al., 1991; Kamolratankul et al., 1993; Saunderson, 1995; Suarez et al., 2003). The results of Floyd's review of 31 cost and 66 cost-effectiveness studies on TB control has found that in developing countries the main impact of economic studies has been influencing policy and practice on the use of short-course chemotherapy, justifying the implementation of community-based care in Africa, and helping to mobilise funding for TB control based on the argument that it is a 'good buy' for governments (Floyd, 2003).

Several studies indicated that at US$1-3 per Disability-Adjusted Life Year (DALY) in low-income countries, and US$5-7 per DALY in middle-income countries, short course chemotherapy for smear-positive tuberculosis is one of the most cost-effective health interventions available (Murray et al., 1991; World Bank, 1993; De Jonghe et al., 1994). However, evidence on cost-effectiveness of interventions such as preventive therapy, active case finding, screening and infection control is limited. In addition to the cost to the health system, direct and indirect costs borne by the patient are equally important for estimating overall societal impact of the disease. A study in Uganda showed that costs borne by the patient may considerably exceed those incurred by the provider, largely because of the assumed loss of income (Saunderson, 1995). Similarly, Nair et al (1997) found that most patients report a 40-60% reduction in income because of their illness. Based on findings from India, Uplekar and Rangan (1996) concluded that on average patients spend almost half of their monthly income on their TB treatment. In their study on economic impact of tuberculosis at the household level in Thailand, Kamolratanakul et al (1999) found that illness-related costs particularly affected patients with incomes below the poverty level. They also found that, in this group, average out-of-pocket expenditure for the disease amounted to more that 15% of their annual household income, while incomes were reduced by 5% due to illness-related effects. In the review of tuberculosis control in India, Ogden and colleagues (1999a) state that the financial burden borne by TB patients may affect completion and continuity of treatment.

The internationally recommended tuberculosis control strategy, called the directly observed therapy, short course (DOTS)[5], embraces passive case detection by means of smear microscopy, directly observed treatment (DOT) with the recording and reporting of treatment outcomes, together with the mechanisms to ensure a regular drug supply (World Health Organisation, 1994). Short-course chemotherapy is the most effective treatment for most patients with TB, and direct observation helps many patients to complete to 6-8 month treatment regimen (Iseman et al., 1993;

[5] While WHO maintained that DOTS contained five elements, only one of which was directly observed therapy (DOT), many believed that what was being pushed by WHO was directly observed therapy only, an approach that is controversial, considered by some to be both operationally and ethically problematic. These concerns centred largely on the perception that DOTS was developed on the basis of a few carefully controlled studies, mainly in Africa, and was being transferred to other settings with different health service, social and economic contexts, in which the DOT component in particular might be problematic to implement (Ogden et al., 2003).

Bayer and Wilkinson, 1995; Fox, Ellard and Mitchison, 1999; Iseman, 2000; Volmink et al., 2000).

The effectiveness of DOTS strategies for the management of ambulatory cases of TB has been reported in many studies (Fox, 1958; Moodie 1967; Morse 1996). In order to promote access to effective TB treatment, the WHO and the International Union Against Tuberculosis and Lung Disease recommend the integration of standard national tuberculosis programmes with general health services (World Health Organisation, 1994; Enarson 1991). Limitations in the provision of widely accessible TB treatment through this approach includes an inadequate health service infrastructure in many countries, insufficient decentralisation to ensure adequate access to care, and human and financial resource requirements that exceed locally available resources (Maher et al 1999; Frieden and Driver, 2003).

2.3.3 Tuberculosis treatment in the private sector

In many high-burden countries, private providers are an important part of the health system. Utilisation of private practitioners for disease such as STIs and TB is quite significant, possibly because of increased confidentiality (Swan and Zwi, 1997; Schneider et al., 2001). The few available studies suggest that in many low-income TB endemic countries, with large public health sectors, private physicians, traditional healers and private pharmacists play a significant role in the initial stages of health seeking by TB symptomatic individuals (Lonnroth et al., 1999; Hurtig et al., 2000). In Asia, the majority of TB patients get their diagnosis and treatment from private medical practitioners (Juvenkar et al., 1995; Uplekar and Rangan, 1996; Uplekar et al., 1998; Lonnroth, 2000; Lonnroth et al., 2001; World Health

Organisation, 2003a). However, case detection and cure rates in the private sector are unknown and little information is available on the size of TB caseload managed in the private sector. Notification of TB cases from the private sector is rare in developing countries. India, for example, has the highest burden of TB and the largest private sector that manages half of the prevalent cases without notifying them (World Health Organisation, 2001b).

The large share of first contacts with private practitioners has important implications for TB control. Concerning TB treatment, a number of authors have identified deficiencies in private sector behaviour. Studies that have examined the prescribing behaviour of private practitioners in treating TB found private practitioners deviate from standard TB management practices (Uplekar et al., 1998; Lonnroth et al., 1999; Hurtig et al., 2000). In one study of the TB treatment practices of private practitioners in Bombay, the physicians were found to use 80 different regimens for the treatment of TB between them, most of them inappropriate and unnecessarily costly (Uplekar and Rangan, 1993). Other studies from India have found that almost half of the TB patients attending private practitioners failed to complete the treatment (Uplekar et al., 1998) and that over three quarters of patients seeing private providers received an X-ray instead of a sputum test (Uplekar, 1999). Hong et al (1995) found that in Korea sputum examination was neglected by general practitioners and treatment regimens were often inappropriate. Olle-Goig et al (1999) document poor adherence to prescribing norms in Bolivia. Studies in Vietnam have shown similar patterns of health care provision for TB by private sector providers: little use of appropriate diagnostic tests, delays in establishing the diagnosis and commencing treatment, and poor referral to the best available public sector services

(Lonnroth et al., 1999; Lonnroth, 2000). There is a concern that these shortcomings in private sector TB care may promote resistance to the drugs that are essential for controlling infections (World Health Organisation, 1994; Brugha and Zwi, 1998; 1999; Weil, 2000).

Evidence from India illustrates that the problem of access is central to people's ability to obtain and maintain appropriate TB treatment (Ogden et al., 1999b). Health sector reforms aimed at improving access through an increased collaboration with the private sector are seen to be beneficial to TB control (Baris, 2000; Kumaresan et al., 2000; Lonnroth 2000; Miller, 2000; Weil, 2000). Whilst involving the private sector may improve quality of care, insufficient incentives to collaborate in TB activities (especially case holding), no improvement in technical capacity, and poor outcomes and drug resistance are potential risks with involving the private sector in the provision of TB treatment (World Health Organisation, 1994; Brugha and Zwi, 1998; 1999; Weil, 2000).

Public sector collaboration with private providers can range from provision of information and education to formal public-private partnerships with small-scale contracting of service components or larger-scale sharing of health care provision and financing (Gilson and Mills, 1995; Mills et al., 2002). Public-private partnerships seek to complement rather than substitute for public health services. Partnerships with traditional healers, community-based organisations and private practitioners can provide a number of benefits, including increased numbers of people receiving services, leveraging of additional resources, improved private provider technical capacity, and adherence to national protocols helping to minimise drug resistance (Uplekar, 2003). Public-private partnership arrangements with private practitioners have been shown to work (Chee, 2003; Newell et al., 2004), but little has been done on the economic aspects of financing and relative efficiency of these arrangements (Uplekar, 2003; Newell et al., 2004; Mahendradhat and Utarini, 2004).

In summary, tuberculosis imposes epidemiological, social and economic burdens in many developing countries. Tuberculosis diagnosis and treatment is characterised by many market failures and has therefore become the main responsibility of government. Whilst the few available studies in Asia show that the private sector plays an important role in TB treatment, and suggests a wide-range in quality and performance, there is no evidence on the extent of diagnosis and treatment of TB in the private sector in Africa.

2.4 Conclusion and unanswered questions

This chapter has reviewed the theoretical and empirical literature on the role of government, public-private mix in the health sector, and economic incentives. Economic theory shows that there are potentially many conflicting roles for the government. Whilst neo-classical economic theory provides guidance as to which roles government should perform (based on the type and extent of market failure), it appears unable to offer much of the understanding of the precise form this intervention should take (Bennett et al., 1997; Jack, 2001). New institutional economics, on the other hand, suggests that high transaction costs, created by the problem of imperfect information in the principal-agent relationship, is one more reason for a dominant government role in provision.

The review has identified a number of key gaps and unanswered questions concerning private sector involvement in the provision of TB treatment and public-private mix. Models of public-private partnership are scarce, especially in developing countries, and economic analysis of public-private mix is limited. In addition, documented literature on practical efforts or experiments involving the private sector in developing countries is extremely scanty. There is a growing international literature on issues related to public-private sector collaboration and co-ordination (Bennett et al., 1997; Mills et al., 2001; Brugha and Zwi, 2002). However, there is limited data on public-private partnerships in health, and even less disease-specific partnerships, at a national level.

Growing recognition of the importance of private providers in the health sectors of developing countries has generated evidence on the behaviour of private health care providers, particularly focusing on cost and quality of care. Documented literature on cost-effectiveness and quality of care of the private sector provision of TB treatment is, however, lacking. Although there is some evidence on the size and scope of private health care activities in developing countries, the empirical information base for policy-making is still very limited. Information on provider incentives and regulation of private providers in developing countries is scarce and does not allow for generalisable conclusions (Hongoro and Kumaranayake, 2000; Kumaranayake et al., 2000a).

The few examples of how to link private providers to TB control programmes and how to create a public-private partnership in order to improve TB treatment come from Asia. Whilst the success of community-based care and involvement of local NGOs in direct observation of TB treatment has been documented, evidence on the involvement of private for-profit providers in Africa is scarce. For instance, there is a lack of published evidence on the value of linking employer based health care providers and private practitioners to TB programmes. Assessment of the extent and nature of private sector involvement in TB care is therefore needed. There is a need for the existing public-private partnership pilot projects to be evaluated in terms of health outcome, cost-effectiveness, equity and quality of care.

In the case of TB treatment, whilst much quantitative data has been collected on coverage of TB patients in the public sector, there is relatively little knowledge of the actual caseload and types of patients treated in the private (for-profit and not-for profit) sector. This information is essential not just for surveillance and monitoring but also to emphasise the need to engage with the private sector. In addition, there is no evidence on cure rates in the private sector. In many high-burden countries, private health care providers play an important part of the health system. However, information on what the private sector is doing for TB control is lacking.

Reforms in health care systems of developing countries frequently focus on 'incentive compatibility' or 'getting incentives right' but a body of convincing empirical research on the effects of various incentives mechanisms on provider behaviour in developing countries is lacking. Health sector reforms also aim to use provider payments to optimise the utilisation of scarce health care resources, transform clinical practice, and improve the quality of care. McPake et al (2002) define this concept as *"the process of designing mechanisms to restructure the* *incentives facing individuals in order to achieve a desirable outcome"*. However, evidence on the most appropriate provider incentives which ensure that patients in the private sector receive good quality TB treatment, is scarce. There is also a need to explore different motivations for participation in public-private partnerships for the provision of TB treatment, and based on the motivations, incentive structures suitable for different providers.

There are a few studies on the TB epidemic and its implications for health care resources (Kumaranayake et al., 2001; Floyd et al., 2002). However, the implications that the HIV epidemic has for TB control and its resource requirements have not yet been estimated on a country-level. Options on the suitable public-private mix in the financing and delivery of TB treatment have not yet been given adequate consideration by most national tuberculosis programmes. Given the scale of the HIV/AIDS epidemic in many developing countries, and its impact on TB caseloads, the existing levels of resources are likely to have to increase in future, and additional funds will be required to cope with the problem. There is a need for an assessment of the resources required to provide TB diagnosis and treatment over the next five to ten years in the specific context of the HIV/AIDS epidemic.

On the basis of these knowledge gaps, the broad objective of this study is to evaluate whether improved TB treatment can be achieved by enhancing partnership between the private and public sectors in African settings. The next chapter provides some specific background to understanding of context in which public-private partnerships exist with an emphasis on the public-private mix in the South African health sector, and the burden of the dual TB/HIV epidemic.

Chapter 3

BACKGROUND AND CONTEXT – SOUTH AFRICA

3.1 Introduction

The literature review has noted the potentially important role played by context in the performance of public-private partnerships. The choice of a case study approach aimed to allow for this to be taken into account. This chapter provides background and details of the context in which the public-private partnerships operate. It also gives some background information on the dual TB/HIV epidemic. Whilst chapter 2 provided an overview of the TB/HIV epidemic in developing countries, this chapter focuses on South Africa-specific data on the impact of the dual TB/HIV epidemic.

This chapter aims to provide some specific background and context to understanding the results presented from the case studies in chapters 5 - 8. The chapter starts with an overview of public-private mix in the South African health sector, with a particular emphasis on financing and structure of the public and private sectors, the distribution of human and physical resources between the two sectors, and utilisation of the private sector. Severe human and budgetary resource constraints faced by the South African government, which affect the current functioning and capacity in the public sector, are discussed. South Africa's powerful private health sector, as well as government policy towards it, is described. The latest policy documents on public-private partnerships, recently recognised as a strategic policy objective, are critically reviewed. Lastly, the current and predicted trends of tuberculosis and HIV in South Africa over the 1998-2005 period are discussed.

3.2 Methods

Document review was the main method used in this chapter. Documents relating to policy on the role of the private sector in health, forms of interaction between the public and private sectors, focusing exclusively on PPPs, and policy objectives of PPPs in health were sought. The following policy documents ranging from 1997 to 2001 relating to policies on the public-private interactions in South Africa were accessed:

1. The White Paper for the Transformation of Health System for South Africa (National Department of Health, 1997)
2. The Health Sector Strategic Framework, 1999-2004 (National Department of Health, 1999)
3. Public/Private Partnerships in Health: National Department of Health Policy Framework (National Department of Health, 2000a)
4. The National Treasury Manual on PPPs Projects (National Department of Health, 2001b)
5. Policy Framework on Public-Private Interactions (National Department of Health, 2001c)

3.3 Public-private mix in the South African health sector

This section briefly reviews the current context of health care delivery in South Africa, highlighting the organisation, financing and structure of the public and private sectors. It also provides a review of the policy context for public-private sector activities in order to contextualise individual PPPs through broader consideration of the way in which the two sectors interact, that is the overall public/private mix of health care provision.

South Africa had a population of approximately 45 million in 2002 (Statistics South Africa, 2002), with around 50% of the population living in urban areas. It is classified as an upper-middle income country with a gross 2002 national income of US \$3 020 per capita (World Bank, 2002). Total annual expenditure on health per capita was US \$222 in 2001, or 8.6% of the GDP, slightly higher than average for middle-income countries (World Health Organisation, 2004). However, the health status of the majority of South Africans does not reflect this relatively high level of spending. Whilst the private sector enjoys relatively substantial resources, a weaker, until recently very fragmented public health sector, struggles to serve the majority of the population. As a result, accessibility and quality of health resources vary enormously across the country, with the majority of South Africans receiving inferior care (McIntyre et al., 1995; McIntyre and Gilson, 2002). The majority of resources in the health sector are spent on a minority of citizens, a reflection of South Africa's inequality.

3.3.1 Health sector financing

The South African health system is characterised by strong public and private sectors with multiple sources of revenue. The public sector provides care for the majority of the public (the indigent and low-income population), while the private sector serves more affluent groups that are able to afford medical scheme coverage. It is estimated that in 2001 private expenditure on health care was almost 59% of total health care spending, (World Health Organisation, 2004a). In 1999, government was the largest source of health care finance (44% of total finances), followed by households (39%) which either pay contributions to medical schemes and other forms of private insurance or pay out-of-pocket for health care goods and services (Doherty et al., 2002). The third source of finances is employers (private firms and government-owned entities) (17% contribution) which fund their employees through health services provided at the workplace, or through contributing to different forms of private insurance on behalf of their employees (Doherty et al., 2002). Finally, donors and non-governmental organisations contribute a small proportion of overall health care financing (0.1%). More specific information about the financing and structure of the two sectors is presented in the sections below.

The public health sector

The financing and structure of the public health sector is directly related to South Africa's system of fiscal federalism. Public expenditure on health is financed almost entirely through general taxation, with local authority revenue, user fees, provincial revenue, and donor funding totalling less than 6% of comprehensive health spending in 1999 (Thomas et al., 2000). Provinces receive a share of the central government's tax revenue that they then decide how to spend, subject to the constraint that 85% of their budget must go to education, health, and social welfare (McIntyre et al., 1999).

Overall government spending limits are determined in a medium-term fiscal framework, which uses budget deficit and tax to GDP ratio targets set by the Department of Finance's macro economic strategy, known as the Growth, Employment and Redistribution strategy (Thomas et al., 2000). This strategy has the explicit objective of deficit reduction in order to improve business confidence and encourage foreign investment. In order to remain within these limits, the South African budget in real terms increased only marginally from R158 billion in 1995/6 to R160.9 billion in the 2001/01 budget (McIntyre et al., 1998). This means that the Department of Health was faced with the task of building up the capacity of public sector health services in the context of a budget that was shrinking in real per capita terms.

There has been significant reorganisation of the health sector, even within the environment of constrained health care resources. To date decentralisation has involved streamlining of the National Department of Health (NDoH), the creation of Provincial Departments of Health and the devolution of powers to the provinces for operational decision-making in health care delivery (Gilson et al., 1999). Provinces are now mandated to provide hospital and primary health care (PHC) services and determine subsidies for local authorities to provide health care services. The process of decentralisation – of devolving authority, responsibility, and resources from the national to the provincial level - and from the provincial to the district level, is by no means complete. Provincial departments of health still lack the capacity to perform some of their functions (for example, licensing and inspection of private hospitals), and management structure and capacity at the district level is not yet strong (Soderlund et al., 1998; Barron and Sankar, 2000). These challenges must be viewed in historical context: over the past 8 years, the government has made considerable progress in transforming the fractured, unequal, race-based health systems it inherited in 1994 to a more rational and unified system with central coordination and provincial/district service delivery (Buch, 2000).

The structure and responsibilities of the public health sector are laid out in the National Health Bill (National Department of Health, 2001a). The NDoH is responsible for developing health policy and legislation, setting goals and priorities, creating norms and standards of care (to ensure equitable and affordable health care provision), and coordinating issue-specific programmes. Provincial departments of health are responsible for day-to-day operation of public health services in their province, which they do through a district-based system. Local government has been made constitutionally responsible for delivering of municipal health services, including all primary care services. Given these responsibilities and the financing process, provincial departments of health enjoy considerable autonomy, although the NDoH does retain the ability to influence provincial health spending by issuing conditional grants. In 1999, excluding debt service costs and a contingency reserve, over 44% of government resources were allocated to the national government, about 54% to the provincial government and 1.3% to the local government (Thomas et al., 2000). In addition, public sector salaries and benefits and regulations regarding personnel transfers are largely determined at the national level, which further limits provincial discretion and control. The main source of local government finance is local taxes and property rates, supplemented through lump sum allocations from the national (and provincial) level.

The private health sector

Private health provision in South Africa can be divided into a large, corporate private for-profit hospital sector and a smaller, rather heterogeneous private non-profit sector consisting of workplace health services and non-governmental organisations. The private-for-profit hospital industry is by far the largest section of non-state hospital provision, and consists of a mixture of independent facilities, and those belonging to large hospital groups.

Medical schemes are a major means of financing private health care, although they provided coverage for less than 17% of population in 1998 (Goudge et al., 2001). It is important to emphasise that medical schemes are not the only source of private sector financing. Out-of-pocket payments and employers (primarily mining industry) comprised about 25% of total private sector financing in 1998 (Cornell et al., 2001) (see Table 3.1 below).

Table 3.1: Private sector expenditure by financing intermediary, 1998

Financing Intermediary	Percentage share	
Insurance/Pre-payment	75.7%	
Medical schemes[a]		*73.0%*
Health insurance[b]		*1.4%*
Worker's compensation[c]		*1.3%*
Firms direct expenditure	1.8%	
Mining industry[c]		*1.4%*
Other firms[c]		*0.4%*
Household's out-of pocket	22.5%	
Medical scheme members[d]		*16.1%*
Non-scheme members[d]		*6.4%*
Total	**100.0%**	
Total expenditure	R33 254 000	
Institutional coverage as % of population[e]	17.1%	

Source: Cornell et al (2001)

[a] Medical schemes are non-profit associations funded primarily out of contributions from employers and employees.
[b] Health insurance policies cover certain health related costs and are offered by life and short-term insurance companies.
[c] Expenditure by firms is over and above their medical scheme contributions on behalf of their employees and is used for direct expenditure for on-site health services and services funded through the Workmen's Compensation mechanism. Industry-specific services range from limited workplace health services to comprehensive care at mining hospitals.
[d] Direct expenditure by individuals or 'out-of-pocket' expenditure includes: 'schemes gap' payments, representing the difference between the fees charged by private health services providers and the amount reimbursed by medical schemes; payment by non-scheme members for consultations with private doctors and for the purchase of prescribed drugs; user fees at public sector hospitals; and spending on over-the-counter medicines by all categories of patients.
[e] Includes medical schemes and mines.

Like the public sector, the private health sector is undergoing significant changes. In the early 1990s, the majority of private health spending was financed through closed enrolment, tax deductible, employment-based medical schemes that paid independent private practitioners on a fee-for-service basis on behalf of their members (Soderlund at al., 1998). As would be expected given the resulting incentive structure, and as confirmed by several specific studies, doctors provided more expensive services than clinically needed (Soderlund et al., 1998; Broomberg and Price, 1990).

Due to premium increases that have risen at double the rate of inflation[1] and changes to the Medical Schemes Act in early 1990s, the schemes have begun to adopt a variety of cost containment measures, including co-payments, pre-authorisation, and limited benefits packages (Soderlund et al., 1998). The cost explosion in the private health insurance market has led to greater enthusiasm by employers for lower cost alternatives to provide cover for their workforce, encouraging the arrival of low cost insurance models based on managed care principles. For all levels of care, medical aid administrators have moved increasingly towards the use of contracts with provider groups that contain an element of risk-sharing as well as greater reliance on the use of formularies and capitation payments to control costs. New chains of private clinics such as Primecure, CareCross, and MediCross (one of the potential partners for the PPP in TB treatment) are moving into this market by offering, via medical aid schemes, a low cost capitated cover for primary care services. Medical aid administrators then purchase hospital cover in a similar manner from a different group of providers and create a comprehensive package of low cost cover to market to industrial companies for their workforce.

[1] From 1990-1995, premiums rose by more than 100%, whilst the Consumer Price Index rose by about 50% (Soderlund et al., 1998).

The experience of private providers with medical schemes and cost containment measures, and concerns about the quality of care, are both important issues that must be incorporated into the analysis of the private sector engagement in the provision of TB-DOTS. This is discussed in next section.

3.3.2 Human and physical resources

Most health care professionals work in the private sector, including the majority of GPs (McIntyre et al., 1995; Tollman and Rispel, 1995) and the private sector cannot be ignored in any description of primary health care delivery in South Africa (see Table 3.2). These figures conceal two important human constraints in the public sector. First, doctors tend to move from the public to the private sector as they gain experience, drawn in part by the prospect of higher wages[2]. Second, there are shortages of doctors and nurses in the public sector in many places, exacerbated in part by the movement to the private sector (and by emigration) and in part by the difficulty of transferring employees to underserved areas (van Rensburg and van Rensburg, 1999).

Table 3.2: Health personnel and resources by sector in 1998

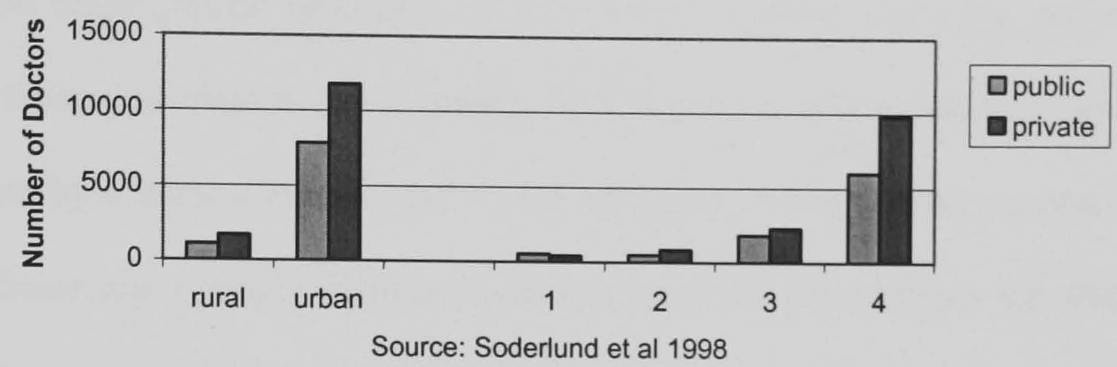
Personnel or Resource Type	Total Number	Proportion in Private Sector
GPs	19 700	72%
Specialists	7 800	75%
Nurses	173 600	41%
Pharmacists	9 700	88%
Hospitals	704	48%
Hospital beds	144 000	25%

Source: van Rensburg and van Rensburg, 1999; Statistics South Africa, 2000

[2] Whilst close to 80% doctors with 0-5 years of experience are in the public sector, approximately 70% of doctors with 16-20 years of experience practice in the private sector (Soderlund et al., 1998).

The majority of doctors in both the private and public sector work in urban areas, and this pattern is mirrored by the average district income data for urban areas. However, the proportion of doctors working in the private and public sectors in rural areas is similar to that for doctors in urban areas (see Figure 3.1 overleaf).

Figure 3.1 Number of doctors in the public and private sectors by location (rural/urban) and by income quartile* (1 is lowest) in 1998



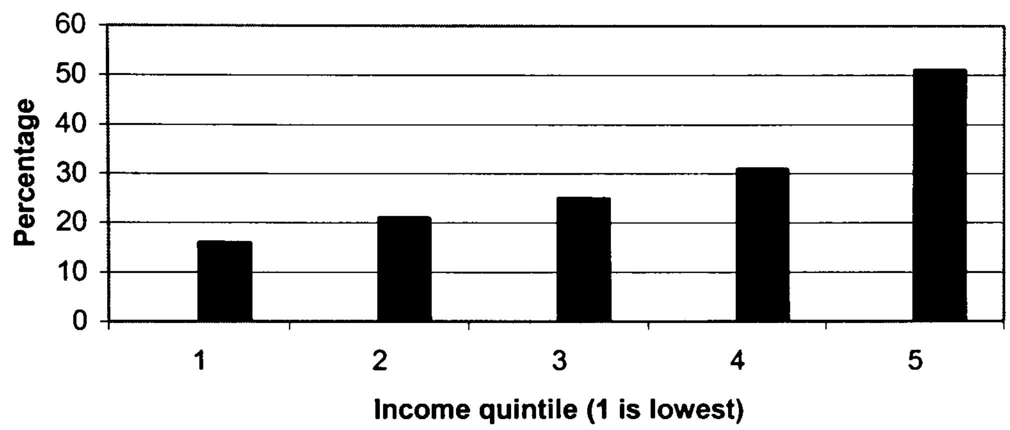
* Quartile refers to the average annual income per family member. Quartile 1 indicates the poorest forth of the population, and quartile four the richest fourth of the populations.

In addition, in the districts from the lowest income quartile there are as many private as public doctors, and almost twice as many in the second-lowest quartile (Soderlund et al., 1998). Regardless of their patient mix (i.e. whether or not most of their patients are covered by medical schemes), most private doctors continue to practice independently (sometimes in Independent Practitioner Associations), with the exceptions of those employed by the mining industry or in the few health maintenance organisations (HMOs) and commercial companies that exist (Soderlund et al., 1998). Physicians (public and private) are required to register annually with the Health Professions Council of South Africa and to undertake about fifty hours per year of continuing professional development, but in practice there is little monitoring of individual doctors (Soderlund et al., 1998; Health Professions Council of South Africa, 2002).

The reforms in the medical schemes are in their early stages, and the extent to which they will affect private providers is unknown. Some analysts believe that there is already some saturation in the market for general practitioner services, with private GPs having to rely increasingly on uninsured, cash-paying patients (Soderlund et al., 1998). General practitioners have to compete for clients, not only amongst GPs, but between GPs and other private providers. A new trend in urban areas are private clinics, such as those described in the financing section above, where patients pay a flat fee to be seen by a nurse clinician and where necessary a doctor, and to receive drugs. These clinics are strongly branded and are favoured by patients for their cleanliness, politeness and prompt service (Palmer et al., 2003). In rural areas, doctors are often employed as district surgeons or medical officers as well as having their own private practices. In their private practices, doctors provide care both to those with medical insurance and those paying a flat fee per consultation.

The 1995 October Household Survey data suggest that 31% of all South Africans who seek treatment for an illness or injury do so in the private sector (Soderlund et al., 1998). Figure 3.2 overleaf shows that although the use of the private sector is consistently higher for higher income quintiles, there is a considerable proportion of poorer groups that are paying for heath care. These utilisation figures suggest that direct costs are not the only determinant of health service utilisation and that patients are increasingly unwilling to accept inadequate, poor quality services. A study on the desirability of contracting out primary care to private providers suggests that the patient choice of primary care provider is mainly influenced by perceptions of the better quality treatment available from private doctors (Palmer, 1999). Whilst private sector use in rural areas is partly due to inaccessibility of public services and perceptions of the quality treatment available from private doctors (Palmer, 1999), in urban areas it is suggested to be predominantly due to preferences for privacy (Rispel et al., 1995), speed of service (Usdin, 1993) and perceptions of higher quality of care (Rispel et al., 1995).

Figure 3.2: Percentage of those ill or injured who used private services by income quintile* using the 1995 October Household Survey data



Source: Soderlund at al 1998

* Quintile refers to the average annual income per family member. Quintile 1 indicates the poorest fifth of the population, and quartile five the richest fifth of the populations.

However, there has been concern about the quality of services for sexually-transmitted infections (STIs) rendered by private doctors. A study by Schneider et al (2001) showed that fewer than 30% of private practitioners provided what would be considered effective care for certain STIs according to national syndromic case management guidelines.

3.3.3 Public-private partnerships as a policy objective

One of the main points of contention in the discussions underlying health policy in South Africa in the early 1990s was the role of the private sector (Gilson et al., 1999). At primary care level, the key issue was how to draw its plentiful human resources into the service of the public sector and bridge the resource gap between the public and private sectors, for instance, by using public funds to contract private providers. Contracting with the private sector had developed in response to particular needs (e.g. part-time district surgeons due to lack of public sector doctors in rural areas; contractor hospitals for TB and psychiatric care due to lack of specialist inpatient facilities in the public sector) (McIntyre, 1997; Broomberg et al., 1997). The new government faced the multiple challenge of attempting to regulate the private sector which was used to operating largely without government regulatory constraints and to achieve this within the context of a federal-type government structure. The National Department of Health is in the process of developing an integrated policy on the private sector.

The section starts by summarising the findings of the policy documents review (in chronological order) and then gives an overview of the range of public-private interactions.

Policy towards the private sector and public-private partnerships

Shortly after South Africa's first democratic elections, enthusiasm for contracts at primary care level was strong. In the draft policy for the establishment of a district health system (National Department of Health, 1995) it was suggested that district health authorities contract with individual or group private practices or NGOs. Partnership between the public and private sectors was recognised as a policy objective in the White Paper on Health (National Department of Health, 1997). The underlying justification for encouraging greater cooperation between public and private providers, with regard to the provision and management of services, is to enhance the capacity of the National Health System to deliver affordable health care to all citizens of South Africa (National Department of Health, 1997).

As stated in the White Paper, the main objectives of public/private partnerships (PPPs) and how they can be achieved are summarised in Table 3.3 below.

Table 3.3: Main objectives of public/private partnerships and how they can be achieved

Objective	How can it be achieved?
Improved efficiency	Either by reducing the cost of the service or increasing the quality and effectiveness of the service
Improved access to health services for under-served populations and access to under-provided services	By using the most cost-effective mean of service delivery and by using private sector resources
Generation of additional resources and revenue for the public sector	By leasing facilities/equipment or expertise to the private sector at a reasonable cost

Source: National Department of Health, 1997

The range of public-private partnerships that may occur within the South African health system are set within the overall public-private mix of the country. The 1997 White Paper on health identifies four broad types of partnership:

- *Purchased services*: where services are required to obtain specialised skills or to meet short-term staffing needs in the public sector. Services may be clinical, management and support. Examples include:
    - Contracts with private doctors for primary care sessions
    - Contracts for clinical equipment maintenance
    - Contracts for hospital beds in private hospitals
    - Contracts with NGOs for community health programmes
    - Contracts with private hospitals for specialised treatment, diagnostic services and beds.

- *Outsourcing*: where an independent organisation contracts to assume full operating responsibility for a specific function which was historically provided in-house within the public sector (e.g. laundry, security).

- *Joint ventures*: service partnerships involving sharing of resources between public and private partners resulting in the provision of increased or higher-quality services, or lower costs.
- *Private finance initiatives*: private companies provide capital funding unavailable in the public sector.

The current 2002-2005 plan or strategic framework for the health sector indicates that the mission of the Department of Health is:

> *"to consolidate and build on the achievements of the past five years in improving access to health care for all and reducing inequity, and to focus on working in partnership with other stakeholders to improve the quality of care at all levels of the health system, especially preventive and promotive health, and to improve the overall efficiency of the health care delivery system"* (National Department of Health, 1999)

There is, however, relatively limited consideration of the private sector in this national document, with the exception of the section on the district health system which states that:

> *"both the provincial and local spheres should explore the role that the private sector (for-profit), NGOs (non-governmental organisations) and CBOs (community-based organisations) can play in extending capacity to deliver these services"* (National Department of Health, 1999)

The PPP section of the five-year plan for the health sector highlights similar issues to those covered in the PPP policy document. It also explicitly notes that:

> *"for the government to benefit maximally from these partnerships [PPP] it is vital that systems and skills be developed in the following areas: contract negotiation, contract drafting and monitoring and evaluation of contracts"* (National Department of Health, 1999)

More specific references to the private sector in these two documents relate to hospital services. Issues such as leasing of unused public hospital beds to the private sector, avoiding the duplication of expensive diagnostic equipment, and admitting more private patients to public hospitals for revenue generation, are raised. There is limited reference to primary health care services with the exception of NGOs for community health programmes and private doctors in underserved areas.

The White Paper on Health (National Department of Health, 1997) states that *"private health practitioners should be integrated with the public sector with regards to the provision and management of services"*. However, very little progress has been made in this direction and more recent policy documents (National Department of Health, 2000a) suggest a more cautious approach towards public private partnerships. It shows that a quite clear shift has taken place in attitudes to public private partnerships, placing a strong emphasis that they should:

> *"not limit the government's ability to guarantee public access to health care. The government must be able to provide, or guarantee provision of services to public patients and must be able to act as the insurer of last resort to private patients. At this stage, this means that the government would not wish to lose control of clinical services for public patients, since these are the core services. In future, however, it may be useful to review whether it may be able to control and guarantee such core services without necessarily being the provider"* (National Department of Health, 2000a)

Shortly after this policy framework was adopted by the national and provincial Departments of Health, the National Treasury developed its own guidelines for PPPs (National Department of Health, 2001b). The guidelines contain the basic documents required by South African public service managers in national and provincial government who are involved with the design, procurement and implementation of PPPs. These guidelines are for all sectors of the economy, not just the health sector. Treasury confines its definition of PPPs to:

> *"a contractual arrangement between a public sector entity and a private sector entity whereby the private sector performs a departmental function in accordance with an output-based specification for a specified, significant period of time in return for a benefit, which is normally in the form of financial remuneration"* (National Department of Health, 2001b)

Thus, they place a heavy emphasis on the contracting out of services. All prospective PPPs, including those in the health sector, have to go through a rigorous Treasury approval process, and must meet three key criteria, namely affordability, value for money and appropriate risk transfer.

In 2001, the National Department of Health has approved a new policy framework which provides a basis for comprehensive, integrated consideration of all public-private interactions (National Department of Health, 2001c). This framework seeks to define PPPs more broadly by considering the full range of complex relationships between public and private providers in South Africa. In terms of this policy, any existing or proposed public-private interaction should contribute to improvements in the financial sustainability and equity of health care financing and provision.

Table 3.4 provides a brief overview of emerging policy issues concerning the public-private mix in South Africa.

Table 3.4: Policy issues concerning the public-private mix in South Africa

Financing	Provision	
	Public	***Private***
Public	• Improved equity, efficiency and quality of care so that the public sector (especially hospitals) is the provider of choice for most South Africans	• Reviewing existing public financing of private services (e.g. tax subsidies on medical scheme contributions, subsidised health professional training, etc) • Reviewing existing mechanisms and future possibilities for purchasing private providers' non-clinical and clinical services, and management services • Reviewing the potential involving the private sector in medical training
Private	• Preferred provider contracts with medical schemes • Exploring potential to draw private finances to support quality public service provision • Evaluating the potential for improving efficiency of resource utilisation by leasing of spare public sector capacity to the private sector • Evaluating the feasibility of Private Finance Initiatives	• Effective regulation of private financing intermediaries (medical schemes and health insurers) and private health care provision (private hospitals, private clinics and health maintenance organisations, workplace health facilities, independent practitioners and NGOs)

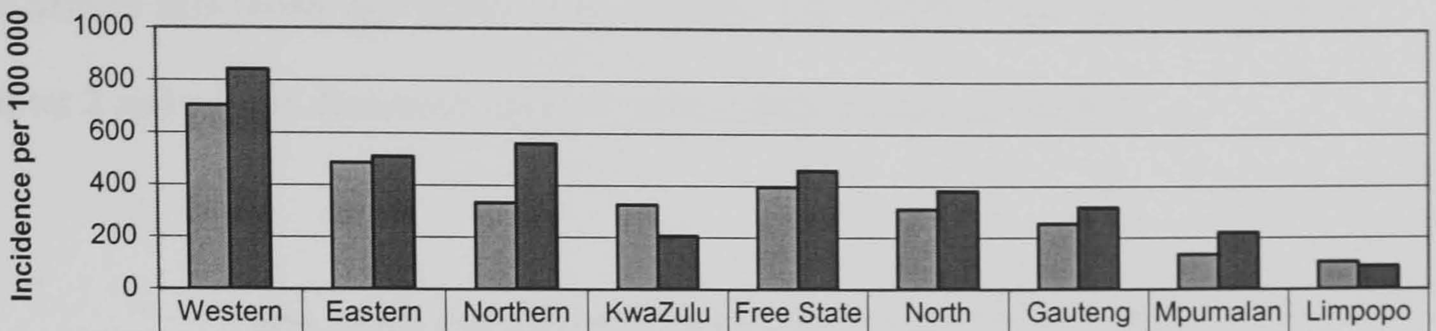
Source: National Department of Health, 2001c

Before describing the nature of TB treatment provision in South Africa, by identifying and defining the main providers of TB treatment and their roles and responsibilities to TB treatment, and describing existing PPPs for TB treatment between these provides (presented in chapter 5), it is important to be familiar with the nature of TB/HIV epidemic. The next section provides the TB/HIV background with an emphasis on the current and predicted trends of tuberculosis and HIV in South Africa over the 1998-2005 period.

3.4 Tuberculosis in light of the TB/HIV epidemic

Tuberculosis in South Africa has reached epidemic proportions. In 2003, it ranked 9th in the world for its contribution to the global burden of tuberculosis (WHO 2004b). In 2001, the country had an estimated burden of 161 112 cases compared to 142 277 cases in 1998 (Department of Health, 2002a). The incidence rate (per 100 000) varied among the nine provinces, ranging from 91 cases in Limpopo to 841 cases in the Western Cape (see Figure 3.3). Since 1998 there was a general increase in the incidence of TB as a result of advocacy, better case detection rates and as a result of increasing levels of HIV infection. Advocacy has been a key component of TB control efforts. Since 1996, when the Minister of Health announced that TB would be regarded as a national priority, TB control has been on the agenda at national, provincial and district level. Provincial TB coordinators have been appointed in all nine provinces and district level TB coordinators in most of the provinces. At the national level, the incidence in all types of TB increased from 338 patients per 100 000 in 1998 to 362 patients per 100 000 in 2001 (Department of Health, 2002a). Figure 3.3 shows the incidence of TB for each province.

Figure 3.3: Incidence of all TB patients per 100 000 per province in 1998 and 2001

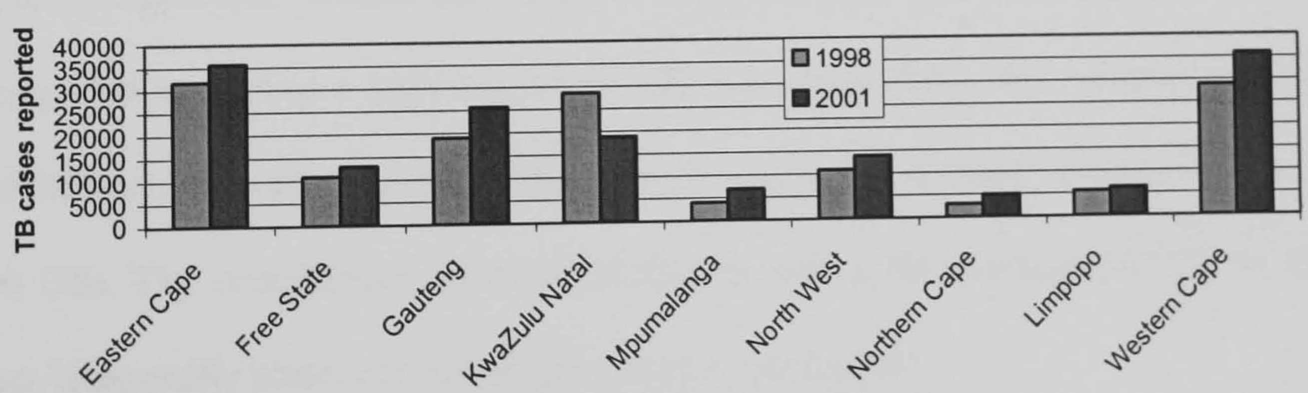


	Western	Eastern	Northern	KwaZulu	Free State	North	Gauteng	Mpumalan	Limpopo
1998	705	487	334	328	398	311	255	136	106
2001	841	510	561	206	460	383	320	222	91

Source: Department of Health 2002a

In terms of absolute numbers, the Western and the Eastern Cape provinces were severely affected, with 35 803 and 35 702 reported cases respectively (Department of Health, 2002). Figure 3.4 shows the number of all types of TB cases reported per province and for South Africa, annually for 1998 and 2001. Although it is difficult to separate real increases in the number of cases from improvements in the reporting system, the figures suggest that the number of cases of TB is increasing at a rate well in excess of population growth.

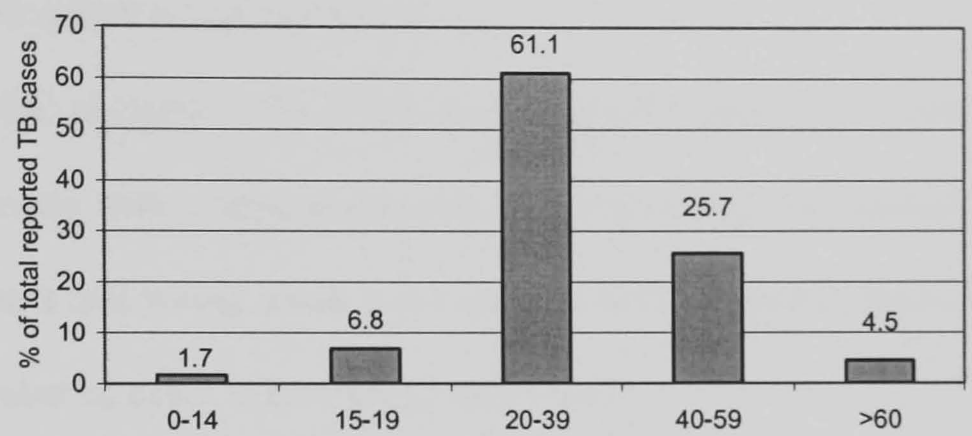
Figure 3.4: Number of all types of TB cases reported per province in 1998 and 2001



Source: Department of Health 2002

Tuberculosis is South Africa mainly affects the economically active age group as is graphically represented in Figure 3.5, where 86.6% of the TB patients reported in 1999 are in the age group of 20-59 years (Department of Health, 2000a). This distribution could have enormous economic implications since HIV infection, the most important factor responsible for the progression of latent TB to active disease, also affects this broad age group most heavily. The TB/HIV link was discussed in chapter 2 and will be discussed again in more details in the next section.

Figure: 3.5 Age distribution of TB patients reported in South Africa in 1999



Source: Department of Health 2000

The enormous variation of TB incidence within South Africa is difficult to explain. The province with the highest incidence, the Western Cape, reports an incidence nine times higher than that reported in the Limpopo province, which has the lowest reported incidence. Whilst the Western, Northern and Eastern Cape provinces are recognised as having a high burden of TB, KwaZulu-Natal, the Limpopo Province and Mpumalanga all report incidences well below the national average of 362 per 100 000. The contribution of under-diagnosis and under-reporting of TB in these three historically under-resourced provinces is not known.

The World Health Organisation attributes the global increase in TB to four factors, all of which are found to some degree in South Africa (Department of Health, 1999): *(a) Socio-economic conditions.* Many South Africans still live in overcrowded conditions conducive to the spread of TB.

(b) The HIV epidemic. It is estimated that 40-50% of people with TB in South Africa are co-infected with HIV. One third of people with HIV are expected to contract TB before they die.

(c) Ineffective TB control programmes. TB control efforts in South Africa have historically been patchy, with well-resourced but poorly managed programmes in some areas with others being neglected.

(d) Demographic changes. The population of South Africa, like most developing countries, is young with a large percentage of children and young adults. Given that many adolescents and young adults were infected with TB during their childhood, an increasing number of cases is emerging in this pool.

Further exacerbating the TB epidemic is the evolution of multi-drug resistant strains of TB (MDR-TB), primarily caused by non-adherence to treatment schedules, and incomplete or inappropriate treatment with one drug. Studies on MDR-TB by the South African Medical Council in all provinces show that an average of 1.8 percent of new cases are MDR and an average of 6.7 percent in re-treatment cases are MDR (MRC 2000). With such rates, some 6 000 cases of MDR-TB could be expected in 2005.

As indicated in chapter 2, a dual TB/HIV epidemic has emerged for many low-and middle-income countries, and that a great majority of TB/HIV cases live in sub-Saharan Africa. Tuberculosis has always been a major public health problem in South Africa that is now exploding because of the HIV epidemic. The next section provides some background information on the HIV epidemic and the dual TB/HIV epidemic.

3.4.1 Tuberculosis and the HIV epidemic

It has been estimated that there were over 6.5 million people infected with HIV in South Africa in 2002 (Medical Research Council, 2002). Over the past decade, country level estimates of HIV infection have been based on surveys of women attending antenatal clinics. This has been the primary means of monitoring the spread of HIV since 1990. On the basis of the 1999 and 2000 surveys, the HIV prevalence rate of women attending antenatal clinics is estimated at 22.4% and 24.5% respectively, compared to less than 1% in 1990 (Department of Health 2001) (see table 3.5).

Table 3.5: HIV prevalence among women attending antenatal clinics in 1999-2000

Province	% of antenatal women who are HIV+ 1999	% of antenatal women who are HIV+ 2000
KwaZulu Natal	32.5	36.2
Free State	27.9	27.9
Mpumalanga	27.3	29.7
Gauteng	23.9	29.4
North West	23.0	22.9
Eastern Cape	18.0	20.2
Limpopo Province	11.4	13.2
Northern Cape	10.1	11.2
Western Cape	7.1	8.3
South Africa	*22.4*	*24.5*

Source: Department of Health 2001

The levels of HIV prevalence reflect large geographical variations amongst the provinces, with Kwa-Zulu Natal consistently reflecting the highest, and the Western

Cape the lowest HIV prevalence rate. For 2000, Kwa-Zulu Natal and Gauteng provinces had the highest increase in the HIV prevalence rate for 2000.

In terms of age, women in age group 20-29 have consistently shown the highest levels of HIV infection (comprising half of the adult HIV positive population) that has significant social and economic implications (National Department of Health 2001d). As no information is available on HIV infection amongst non-pregnant women, men, newborn babies and children, projections have been made to extrapolate HIV infection to the general population.

Dorrington et al (2001) estimate that about 40% of the adult deaths aged 15-49 that occurred in the year 2000 were due to HIV/AIDS and that about 20% of all adult deaths in that year were due to AIDS. These estimates indicate that AIDS has become the single biggest cause of death in South Africa. The projections show that, in the absence of treatment to prevent AIDS, the number of AIDS deaths can be expected to more than double the number of deaths due to all other causes. It is estimated that by 2010 there will be between 5 and 7 million cumulative AIDS deaths (Dorrington et al., 2001).

The relationship between TB and HIV has been well documented (De Cock et al., 1991; De Cock et al., 1992; Narain et al., 1992). In general, the HIV prevalence among adult TB patients is usually 2-3 times higher than among the general population (World Health Organisation, 2000; Mukadi et al., 2001). It is estimated that in South Africa the percentage of people with TB who are HIV-positive is around 43% (Department of Health, 2001) (see table 3.6 below). Given the projected continued increase in the prevalence of HIV, the Medical Research Council of South Africa estimates that annual TB incidence in South Africa could more than double again by the year 2005 (Medical Research Council, 2000).

Table 3.6: Estimated HIV status among TB patients in 1999

Province	Estimate % HIV+ amongst TB cases in 1999
KwaZulu Natal	35.1
Free State	46.8
Mpumalanga	39.9
Gauteng	59.7
North West	54.2
Eastern Cape	28.3
Limpopo Province	31.4
Northern Cape	40.6
Western Cape	26.7
South Africa	*42.7*

Source: Department of Health 2001

It is estimated that South Africa has a TB/HIV co-infection rate of 2 540 per 100 000 and a TB case fatality rate of 166 per 100 000, a rate which is five times higher than the global TB fatality average of 32 per 100 000 (Dye et al., 1999). In recognition of this threat, all provincial health departments in the country have agreed to promote the management of TB and HIV as a joint epidemic. Four TB/HIV integrated management pilot sites were established in the country during 1999[3]. The main objectives of this TB/HIV initiative were to increase access to HIV voluntary counselling and rapid testing, and improve TB case finding, TB treatment completion rates and TB cure rates among people living with HIV/AIDS through community involvement.

[3] The South African Department of Health is participating in the WHO/UNAIDS ProTest Initiative that seeks to increase access to voluntary HIV counselling and testing and improve TB/HIV care. The ultimate goal of the initiative is to reduce the burden of the combined TB and HIV epidemics.

Although these sites were established when antiretroviral therapy (ART) was considered unaffordable for most developing countries, there is now a strong international commitment to implement ART through the World Health Organisation's initiative to start 3 million people on ART by the end of 2005 (World Health Organisation, 2003c), the Global Fund Against AIDS, TB and Malaria, and other initiatives. South Africa decided to implement a national plan to roll out ART in November 2003 (National Department of Health, 2003). The interventions of the TB/HIV initiative could be included as part of the package of care for people living with HIV during the roll out of ART in South Africa.

3.5 Conclusion

This chapter has focused on background and context for both the structure of the public-private mix in the South African health sector and burden of the dual TB/HIV epidemic. The private sector is an important component of the health care system in South Africa, employing an increasing proportion of health care providers while resources available to the public sector are declining. In particular, this chapter has highlighted that the Department of Health is faced with a legacy of fragmented services, inequity and a weak public sector human resource base which leads them to depend on the stronger private sector to meet demands of even basic service provision. On top of that, South Africa is experiencing a rapidly emerging TB/HIV epidemic that already has serious implications for health system resources. The evidence shows that the HIV epidemic has caused a substantial increase in demand for TB services. The background and context of the public-private mix suggest that the public sector cannot effectively control TB epidemic without drawing on the private sector. One response is to find effective ways to manage rising TB caseloads through strengthened public-private partnerships in the provision of TB treatment.

Public-private partnerships remain a relatively new phenomenon in South Africa, and are seen as one component of the public sector's overall strategy for the provision of public services. This does not imply that public-private partnerships are the preferred option for improving the efficiency of services but are one of a range of possible service delivery options available to government. However, the evidence on performance of public-private partnerships is lacking. Given the policy interest in involving private providers for the provision of public services, evaluation of public-private partnerships is vital. All recent policy documents stress four key goals – equity, coherence, quality of care and efficiency – which provide a useful basis for decision-making about public-private partnerships. Appropriateness of existing and new public-private partnerships could therefore be evaluated in relation to the achievement of these key health systems goals.

Chapter 4

STUDY DESIGN AND METHODS

4.1 Introduction

Chapter 3 focused on South Africa, with an emphasis on the public-private mix in the South African health sector, and the epidemiological and economic burden of the dual TB/HIV epidemic. An important conclusion drawn is that the private sector is an important component of the health care system in South Africa, employing an increasing proportion of health care providers while resources available to the public sector are declining. Public-private partnerships are, therefore, seen as one possible service provision option available to government. The rapidly emerging TB/HIV epidemic in South Africa has serious implications for current and future health system resources. The discussion in chapter 3 concludes that the public sector cannot effectively control rapidly emerging TB epidemic without drawing on the private sector.

The aim of this chapter is to present the study design and a brief overview of methods used in this thesis. It starts with a conceptual framework provided by the review of theoretical and empirical literature in chapter 2 and background information in chapter 3. Study aims and specific objectives are then presented, followed by an overview of research questions and methods for addressing them. Lastly, justification for a case study approach and description of case studies in this thesis are given.

4.2 Conceptual framework

Given the broad spectrum of different types of organisational arrangements, in terms of financing and provision, between government and the private sector (as shown in chapter 2), for purposes of this study public-private partnerships are defined as formal or informal collaboration between the government (the Department of Health, or more precisely, the Provincial TB Control Programme) and the private sector (both for- and not for-profit private providers) where the government subsidises private providers to provide good quality TB treatment following the national treatment guidelines.

In this study, the private sector is defined as all those health care providers working outside the direct control of the government. They are as follows:

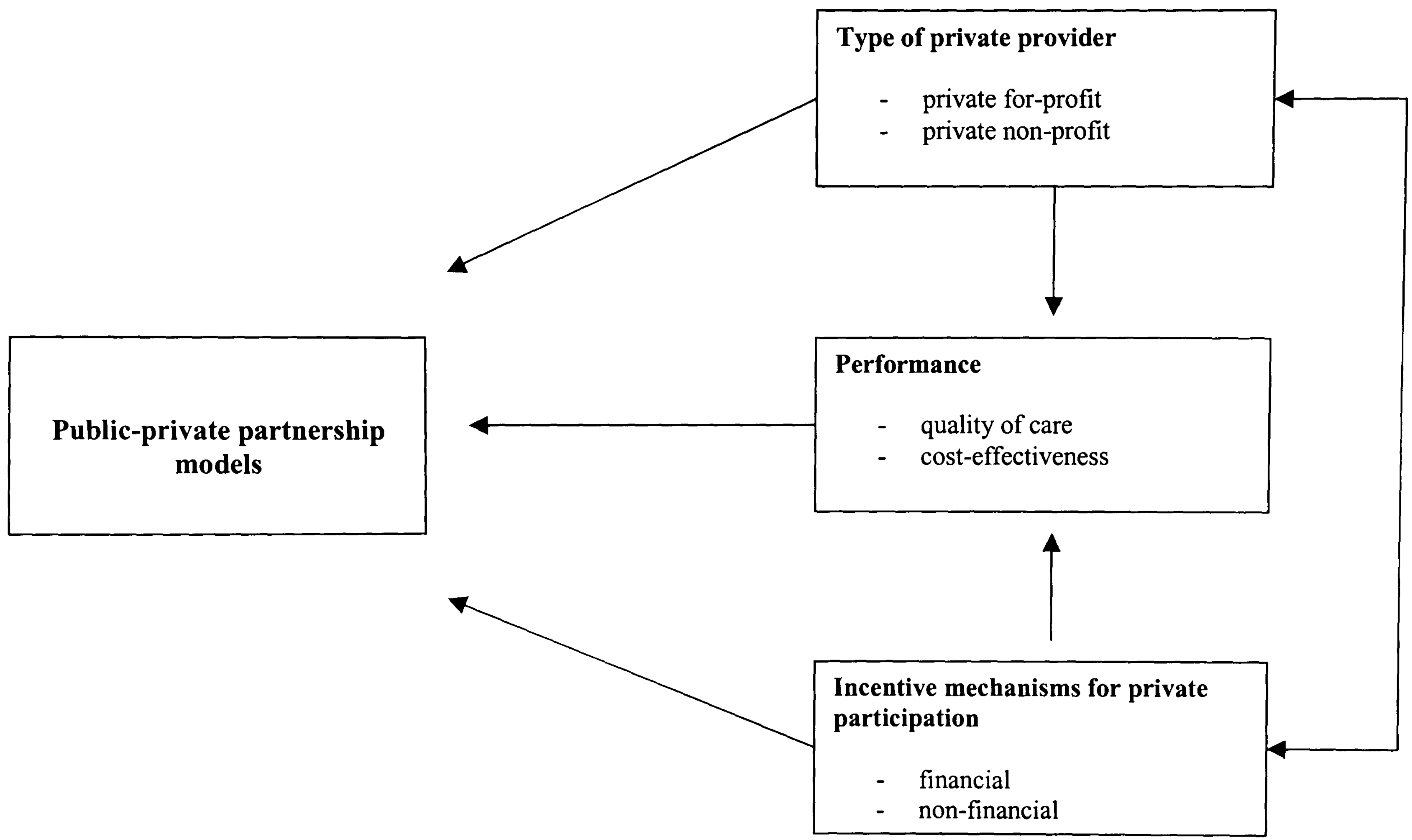
1. For-profit providers
    a. private practitioners working in solo or group practices, such as Independent Practitioners Associations
    b. commercial clinic companies which provide primary health care to patients who pay a flat fee per visit
    c. traditional healers
2. Non-profit providers
    a. NGOs, the majority of non-profit providers in South Africa.
    b. mission or church related facilities
3. Employer-based providers
    a. companies directly providing health services to their employees

b. Health Maintenance Organisations (HMOs), either linked to an employer or provide services independently. In the first case, the HMOs are usually paid on a capitation basis by the employer to provide services to the employees.

The definition of employer-based providers is somewhat blurred in that it is not always clear whether they are for-profit or non-profit providers. For example, whilst an employer is not directly maximising profit by providing TB treatment to their employees, one of the driving forces behind it is to maintain their workforce healthy in order to keep them productive. For purposes of this study, both types of employer-based providers are classified as for-profit providers for the two following reasons. First, where TB services are provided directly by a company, and health care providers are effectively the company's employees, their for-profit nature stems from the for-profit nature of the company employing them. Second, whilst the HMOs may call themselves non-profit organisations, the definition of private health sector classifies health maintenance organisation as "more complex for-profit multi-institutional forms" (Bennett, 1991).

A number of categories drive the conceptual framework for the evaluation of public-private partnerships in the provision of TB treatment (see Figure 4.1 overleaf).

Figure 4.1: Overall conceptual framework for evaluating public-private partnerships in the provision of TB treatment



First, public-private partnerships depend on the type and characteristics of private providers operating within the system. Second, different arrangements between public and private providers have differential impacts on quality of care and cost-effectiveness. Third, it is assumed that different private providers (i.e. private for-profit and private non-profit) have different motivations for participation in partnerships for the provision of TB treatment. Differences in motivation between public and private sector actors raises additional issues of appropriate incentive mechanisms that can be used to achieve converging public-private interests. The response that different incentive mechanisms create for different private providers has an impact on the performance of public-private partnerships. Overall, the enhanced role of the private sector in the provision of TB treatment depends upon the contextual circumstances such as the existence of appropriate socio-economic conditions, the size and distribution of the private sector providers, and their degree of organisation; and, government institutional and financial capacity. Given this conceptual framework, the study will evaluate different models of public-private partnership in the provision of TB treatment in South Africa.

4.3 Aims and objectives

This study aims to evaluate the performance of different models of public-private partnerships in the delivery of TB treatment in South Africa. It also aims to explore incentive mechanisms for private sector participation in public-private partnerships, in order to make recommendations to policy-makers in South Africa on the best way to approach a policy on the enhanced role of private sector providers in TB treatment.

The specific objectives of the thesis are:

1. To understand the nature of public-private interaction in TB treatment in the African context in light of the HIV/AIDS epidemic.
2. To describe the nature of TB treatment delivery including models of public-private partnerships, in terms of what they are, the nature of partnerships and who is responsible for monitoring them in South Africa.
3. To evaluate specific public-private partnership models of delivery of TB treatment in terms of cost, effectiveness and quality of care, and to compare their performance with that of public sector providers.
4. To explore motivations of partners within existing partnerships, incentive mechanisms attributable to different models of public-private partnerships, potential partners in the provision of TB treatment, and incentive structures for broader public-private partnerships.
5. On the basis of these findings, to make recommendations on how policy-makers in South Africa and elsewhere could best approach a policy on different ways of involving private providers in the provision of TB treatment.

4.4 Overview of methods for objectives

To achieve the above aims and objectives, and following from the concepts highlighted by the literature review in chapter 2, a series of research questions are posed for each study objective. Table 4.1 overleaf gives a summary of study questions and overview of methods used to address them.

Table 4.1 Study objectives and the methods used for addressing them

Objective	Research question	Sub-study	Methods used	Sampling method	Sample size
1 and 2	Who are the main providers of TB treatment and what are their roles and responsibilities? What is the level of involvement of private providers in TB treatment? What forms do the public-private partnerships in TB treatment take? How do they operate?	Situational analysis (chapter 5) South Africa as a case study.	1. Document review of policy documents, published and unpublished documents and reports, policy statements, and internal regulations of organisations 2. Open-ended interviews with key informants	1. Not relevant 2. Snowballing	1.Not relevant 2. Fifteen key informants (8 from the public sector and 7 from the private sector)
3	What is the technical, process and outcome quality of TB treatment? In terms of quality of care, how do these models compare to the public sector providers of TB treatment?	Quality of care (chapter 6) Three different models of the provision of TB treatment as case studies. For each model, 2 sites were selected by purposive sampling.	1. Technical quality checklist of buildings, equipment and medical supplies available 2. Semi-structured interview with facility manager 3. Semi-structured interview with health care providers 4. Retrospective reviews of TB patient records	1.Purposive sampling 2. Purposive sampling 3. Purposive sampling 4.Random sampling	1. Six checklists (1 in each site) 2. Six interviews (1 in each site) 3. Fourteen interviews (6 doctors, 6 nurses, and 2 lay workers) 4. Hundred and twenty records
3	How cost-effective are public-private partnership models for the provision of TB treatment compared to the public sector providers? Who bears the burden of public-private partnerships? .	Cost-effectiveness (chapter 7) The same models and sites selected for the quality of care sub study were used for this sub study.	1. Document review 2. Semi-structured interview with facility manager 3. Retrospective structured patient interview. 4. TB register review	1. Not relevant 2. Purposive sampling 3. Random sampling 4. All new patients who started treatment during the 12-month costing period.	1. Not relevant 2. Six interviews (1 in each site) 3. Hundred and twenty (20 in each site 4. Hundred and twenty patients (20 in each site)
4	What are the motivations of partners in existing PPPs? Who are potential private partners? What are obstacles to providing TB treatment in the private sector? What are the incentive structures that may be needed for a well-functioning PPP?	Incentives for existing and potential partners (chapter 8)	Semi-structured interviews with government officials and private providers currently in public-private partnerships and potential partnership participants.	Purposive sampling	Fourteen interviews (5 with the Department of Health officials, 3 with the private for-profit providers, 2 with the private non-profit providers, and 4 with potential partners.

Detailed presentation of methods and analysis for each study objective is given in chapters 5 - 8. In this study, both quantitative and qualitative methods are used as the two approaches complement one another, allowing research to benefit from the respective strengths of each (Dingwall et al., 1998).

4.4.1 Choice of the case study approach

This study employs a case study approach – a research method that focuses on the circumstances, dynamics and complexity of a single case or a small number of cases (Bowling, 1997). The case study approach is useful where the relevant influences are difficult to distinguish from the general environment (Keen and Packwood, 1999). Multiple research methods are usually employed in a case study in order to investigate complex situations fully and to validate the findings (Bowling, 1997). A case study approach has both strengths and weaknesses. The strength of qualitative research is its ability to aid understanding, provide explanations and explore issues, particularly those of a complex nature (Coast, 1999). Its weakness, in comparison to quantitative research, is that it does not provide empirical data that are statistically generalisable to whole populations (Coast, 1999).

A case study is a study of an event that also includes its real-life context. Features of a case study are the attempt to measure multiple variables using a variety of methods, and seeking to triangulate findings from these different methods. Case studies have traditionally been criticised as being a rather weak approach offering somewhat tentative conclusions and limited degrees of generalisability (Black, 1994). However, this perspective derives from a highly positivistic conception of the nature of science (Yin, 1994). Case studies are particularly appropriate when: (1) contextual conditions are a relevant issue for the study; (2) there are complex casual links between many variables to attempt to understand; (3) the focus is on a contemporary phenomenon within some real-life setting; and, (4) researchers have no control over events and so an experimental approach is not feasible (Yin, 1994; Keen and Packwood, 1999).

In summary, case studies are good for analysing complex relationships and allowing for the importance of context. This is particularly relevant for the empirical study of the implementation of real-life policy. However, the inclusion of the context creates several technical challenges (Yin, 1993). First, the richness means that the study will need to use multiple sources of evidence. Second, the richness of the context means that the study will have more variables than data points. Third, even if all the variables are quantitative, different strategies will be needed for research design and for analysis (Yin, 1993). Given the importance of background and context factors summarised in chapter 3, a case study was clearly the most appropriate choice for being able to study the nature of public-private partnerships in South Africa in the 'real world'. This, combined with the small number of existing public-private partnerships for the delivery of TB treatment available for study, lead to the selection of the case study approach.

4.4.2 Design of the case study

There are two types of case studies in this research: (1) South Africa is selected as a case study; and, (2) within South Africa, each model of public-private partnership chosen for the purpose of performance evaluation represents a case study. Each of these is described below.

South Africa as a case study

South Africa was chosen as the principal case study in this research for a number of reasons. First, South Africa has one of the highest TB incidence rates in the world, which is worsening with the growing HIV epidemic. In 2001, the country had an estimated burden of 161 112 cases compared to 142 277 cases in 1998, with the incidence rate (per 100 000) ranging from 91 to 841 cases in different parts of the country (Department of Health, 2002a). It has been highlighted that in order to achieve the South African target of detecting 70% of infectious cases and curing 85% of those detected, additional funding is likely to be required for new kinds of interventions (World Health Organisation, 2001a). The evidence shows that the HIV epidemic has caused a substantial increase in demand for TB and general medical services (Floyd et al, 1999). This has enormous implications for health system resources, and one of the challenges is finding effective ways to manage rising TB caseloads through improved public-private mix. Second, South Africa has a considerable private health care sector. Higher private sector incomes have led to an outflow of health personnel from the public sector. At the same time, a rapidly emerging TB/HIV epidemic, along with free primary health care, is likely to have compounded the problem by increasing the demand for public care. Third, there is a policy discussion and debate around the role of the private sector and existing/potential public-private partnerships in the health sector. It has been recognised that the advantage of developing new partnerships with private sector providers is that they have substantial resources available (particularly human resources), and, therefore, there is a need for the public sector to pro-actively use public-private partnerships as a means of increasing the resources available to the public sector, enabling it to improve the quality of care (South Africa 1997). Finally, the researcher's personal knowledge of the country and TB control efforts through previous work was expected to reduce the access time to individuals and documents.

Three provinces in South Africa were selected for this thesis: Western Cape, North West and Free State. The main reason for selecting the Western Cape was because this province has the highest TB incidence in the country, and amongst the highest in the world. Chapter 3 indicated that the incidence of TB patients per 100 000 was 841 in 2001 (see Figure 3.3 in chapter 3), making TB one of the most important public health problems in the province. In addition, the Western Cape has the longest tradition of NGOs involved in tuberculosis. Reasons for selecting the Free State and North West as study provinces are as follows. First, the incidence rates of TB among miners in these provinces are almost ten times higher than those among the general population (see chapter 3). Second, mining companies are responsible for the provision of TB treatment to a large number of employees and, in some cases, to their dependents. Last, partnerships with private practitioners in the Free State and with traditional healers in the North West are emerging.

For purposes of describing the provision of TB treatment in the public sector (as a part of addressing the study objective 2), three districts in the Western Cape were selected using purposive sampling. In order to enhance the generalisability of the analysis, seven potential districts were first selected to ensure different settings were represented (urban versus rural) as well as different population sizes and density of districts. The choice of potential districts was then narrowed down to five districts, based on the high TB incidence and HIV prevalence in the districts. The final selection of three districts included availability and utilisation of alternative service provider (NGOs and private for-profit providers) and the proportion of TB patients supervised in the community TB programmes (see Table 4.2 overleaf). The selected districts were Khayelitsha, Helderberg, and Central district. Although the districts within the Western Cape that are most affected by TB are the predominantly rural districts, due to a continued influx of residents from the rural areas, and the rising HIV epidemic, there is an increase in incidence of new smear positive TB patients in peri-urban and urban districts.

Table 4.2: Selection criteria and ranking of districts selected for the study

District	Setting	TB incidence and HIV prevalence in 2001	Availability and utilisation of alternative service providers
1. Khayelitsha*	• Peri-urban	• Very high**	• Public providers • NGOs • Large number of TB patients supervised in the community
2. Central*	• Urban	• Very high	• Public providers • NGOs • Private practitioners and private hospitals • Some TB patients get TB treatment in the private sector
3. Helderberg*	• Rural	• Very high	• Public providers • NGO • Large number of TB patients supervised in the community
4. Nyanga	• Peri-urban	• Very high	• Public providers • NGOs • Large number of TB patients supervised in the community
5. Oostenberg	• Rural	• Very high	• Public providers • NGOs • Small number of patients supervised in the community
5. George	• Urban	• High***	• Public providers • Private practitioners and private hospitals
6. Drakenstein	• Rural	• Very high	• Public providers • Large number of TB patients hospitalised
7. Cape Agulhas	• Rural	• High	• Public providers • A large proportion of TB patients hospitalised

* Districts chosen for the public sector sites. ** TB incidence 500 - 850 per 100 000; HIV prevalence 25 - 40%
*** TB incidence 250 - 500 per 100 000; HIV prevalence 10 - 25 %

Model of public-private partnership as a case study

In addition to selecting South Africa as the principal case study, each model of public-private partnership for the provision of TB treatment represents a case study on its own.

Two models of public-private provision were studied in great detail and then compared with the third model – purely public provision. Definition, selection and justification of PPP models chosen for this study are given in chapter 6. A common framework, described in detail in chapters 6 and 7, is used to analyse the nature of these two models, their performance in terms of cost, effectiveness and quality of care.

4.5 Conclusion

This chapter described and justified the choice of research design and presented a brief overview of methods used in this thesis. Detailed methods and analysis for each study objective are described in the next four chapters. In line with the research questions highlighted in this chapter and figure 4.1, the next four chapters describe the main providers of TB treatment and existing public-private partnerships for the provision of TB treatment in South Africa (chapter 5); present quality of care and cost-effectiveness of TB treatment in three models of public-private partnership (chapters 6 and 7); and, explores motivations for participating in existing and potential partnerships, and incentive mechanisms for different models of current and potential private sector participation in TB treatment (chapter 8).

Chapter 5

SITUATIONAL ASSESSMENT OF PUBLIC AND PRIVATE PROVIDERS OF TUBERCULOSIS TREATMENT IN SOUTH AFRICA

5.1 Introduction

As outlined in the conceptual framework, a number of factors will determine whether TB treatment can be improved by enhancing partnership between the private and public sectors in African settings (and whether it is worthwhile subsidising the private sector provision of TB treatment). The feasibility of increased public-private partnerships in health care will depend, amongst other factors, upon the nature of the services itself as well as upon contextual circumstances. This chapter focuses on the nature of TB treatment delivery in South Africa, seeking to explain "who is doing what" by describing the main providers of TB treatment, their roles and responsibilities, and the level of involvement of private providers in TB treatment. It also aims to describe existing models of public-private partnerships, in terms of the nature of partnerships and who is responsible for monitoring them in South Africa.

While most of the international literature on the provision of TB treatment focuses on issues related to the public sector, there is little about what happens in the private for-profit and private non-profit sectors, and even less examination of public/private sector collaboration. In this chapter, the public-private mix in TB treatment delivery in South Africa is reviewed. None of what follows is intended to be a comprehensive review, but rather this chapter sets a scene in selected provinces where the further study is going to take place. The chapter starts with the methods used for the review. It then provides an overview of the National TB Control Programme and focuses on public services in the Western Cape province. Public sector services are not reviewed in other provinces. A country-level review of private sector provision, including private for-profit and private non-profit providers, is then given. For each service provider, the review includes characteristics of providers such as the organisation of TB service delivery, cost and utilisation of TB treatment, and interaction between providers. Finally, different arrangements between public and private providers of TB treatment are reviewed in the provinces of the Free State, North West and Western Cape.

5.2 Methods

Two methods employed to answer the first two study objectives, in this chapter, are document review and open-ended interviews with key informants. Document review is widely used as a starting point for research as it has the advantage of being non-reactive and relatively low in cost (Robson, 1993; Bowling, 1997). However, both content and the context under which documents were produced were examined in order to acknowledge any bias or incompleteness, and information obtained through document analysis was therefore triangulated through interviews with key informants. Key informants were located using a snowball technique, a technique used when no sampling frame exists and it cannot be created (Bowling, 1997). Interview schedule for key informants is presented in Appendix I.

Review of the National Tuberculosis Control Programme (NTCP)

The following documents were used for the review of the National TB Control Programme:

1. The South African Tuberculosis Control Programme Practical Guidelines (Department of Health, 2000a)
2. Medium Term Development Plan 2002-2005, National Tuberculosis Control Programme of South Africa (Department of Health, 2001)

The review focused on the Programme's history, strategy and organisation and was used to evaluate institutional environments surrounding the provision of TB treatment in the public sector. A total of five interviews were conducted with the NTCP managers (n=2) and the provincial TB control programme coordinators (n=3). All the interviews with key informants were open-ended and exploratory. The main focus of these interviews was the broader context of TB control in order to identify and define the main public sector providers of TB treatment, their roles and responsibilities to TB treatment, and existing partnerships for the provision of TB treatment between public and private providers.

Review of the public sector provision of TB treatment

Documents which were collected and reviewed at the district level include published and unpublished documents, reports, policy statements and internal regulations of organisations, and reports pertaining to or written by the public providers. To triangulate the document review, three key informants interviews were conducted with district managers focusing on the extent of provision of TB treatment, delivery points for TB treatment and characteristics of providers in the three districts.

Review of the private sector provision of TB treatment

The review of the private sector provision of TB treatment relied on the following policy documents:

1. The Medical Schemes Act (National Department of Health, 2000b)
2. The Mine and Safety Act (National Department of Health, 1996)
3. The Occupational Disease in Mines and Works Act (National Department of Health, 1973)
4. The Health Act (National Department of Health, 1977)

The review of these documents was used to evaluate institutional and regulatory environment surrounding the provision of TB treatment in the private sector. In addition to the policy documents, published and unpublished documents, annual reports, and health care industry related literature were reviewed. Seven key informant interviews were conducted with officials from the private sector Medical Scheme Funds and Fund Administrators, the Chamber of Mines, the South African Medical Association, academics, chest specialists, and managers from local NGOs involved in the provision of TB treatment. All the interviews with key informants were open-ended and exploratory. The main focus of these interviews was the private sector providers of TB treatment in South Africa, their roles and responsibilities to TB treatment, characteristics of providers, formal interaction between the private and public sectors, and relationship with the provincial tuberculosis programmes. These interviews were also used to describe the main characteristics of different existing public-private partnerships for TB treatment in the three study provinces.

5.3 Results

5.3.1 Overview of the National TB Control Programme

Until 1996, the actual diagnosis and the delivery of tuberculosis treatment in South Africa was highly disorganised. Tuberculosis treatment services were vertical in nature, and separated from other primary and secondary care services (Bayer and Wilkinson, 1995). Case definition for notification was ill defined and in many areas, especially rural, TB was under diagnosed as there were no health facilities available (or those that were present were inaccessible), and most cases were hospitalised for long periods. In 1997, the National Health Department decentralised responsibility for delivery of health care to the provinces, and actual delivery of TB services is seen to occur through the district health system as part of general health services.

A National TB Control Programme that existed from 1979, within the previous government health structures, failed at several levels. The complexity of attempting to co-ordinate vertically controlled TB services for fragmented health authorities of the various "affairs" for different races, and for homelands and independent states rendered it unworkable. The reasons for failure of the TB programmes are: (1) lack of uniform policies for diagnosis and treatment; (2) frequently changed policies; (3) irregular funding; (4) insufficient nurse involvement; (5) lack of discipline of health workers; and (6) absence of community involvement and deficiencies in infrastructure (Edginton, 1997).

After a national survey in 1996, the NTCP implemented the DOTS strategy (in line with the internationally recommended tuberculosis control strategy discussed in chapter 2), with aims to expand effective and accessible TB services throughout the country. The five elements of the South African strategy are (Department of Health, 2000a):

1. Government commitment to a national TB control programme as a specific health system activity, integrated into comprehensive primary care, and supported technically at national level.

2. Passive case detection[1] by means of a patient-friendly and clinically efficient service based primarily on smear microscopy. People with symptoms indicative of TB who attend primary health care (PHC) facilities or seek treatment from health practitioners should be identified and investigated appropriately.

3. Standardised, directly observed, short-course treatment, prioritising sputum smear positive (or infectious) patients. Directly observed treatment involves each patient having a treatment supporter or supervisor who observes the patient swallowing his or her treatment on a daily basis for at least the first two months of treatment. "Short-course" refers to a treatment of six to eight months' duration which is shorter than previous regimes which require treatment for nine to eighteen months.

4. Standardised treatment in the correct combination and dosage. A reliable supply of necessary TB drugs in all PHC facilities is therefore essential.

5. Effective monitoring using standardised registers, quarterly reporting and clear definitions and treatment outcomes.

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[1] The term 'case detection' recognises the fact that there are unknown cases in a community who may not present to the health sector, or who may not be identified when they do present (Broekmans, 1994).

The NTCP aims to reduce the TB burden in the country through the provision of supervised TB treatment to all patients. The use of the directly-observed treatment for all TB patients, regardless of the likelihood of non-adherence to treatment, was preferred by most authors in international literature to strategies of attempting to identify likely non-adherent patients, or to promote effective self-treatment (Bayer and Wilkinson, 1995). There is a debate over universal DOT versus a mixture of DOT and self-treatment, and whether or not to include lay worker DOT supporters, medication monitors, private practitioners and traditional healers in the TB control programme (Uplekar and Rangan, 1995; Garner, 1998; Zwarenstein et al, 1998; Moulding and Caymittes, 2002; Khan et al, 2002; Colvin et al, 2003). South Africa has adopted a flexible local adaptation of the DOT approach where different options exist for providing DOT to the patients. Selection depends on the preferences of the patients and availability of DOT supporter networks.

One of the emerging issues in South Africa is multi-drug resistant tuberculosis (MDR-TB), defined as resistance to treatment with standard TB drugs (specifically isoniazid and rifampicin). MDR-TB results primarily from inadequate treatment, (due to improper prescribing practices), lack of patient adherence to treatment, irregular supply of drugs, and poor TB control programmes (WHO/International Union Against Tuberculosis and Lung Disease, 1997). Treatment of this form of disease involves the use of less effective second-line drugs costing 10 to 20 times the cost of treating an uncomplicated drug-susceptible case.

It has been estimated that it costs R8 428 per patient for the MDR drugs alone as opposed to R391 for a new patient with ordinary TB (Department of Health, 2003).

Such patients generally require to be hospitalised for long periods of time (usually between six and eighteen months), adding significantly to the cost of their treatment. Accurate figures for MDR-TB are not available but studies in three provinces (Western Cape, Mpumalanga and Gauteng) in 2001 indicate a rate of 1% in new MDR-TB cases and 4% in retreatment cases (Department of Health, 2002a). This translates into about 2 000 new cases of MDR-TB in South Africa each year. Cure rates are generally below 50% even in the best circumstances. MDR TB-related mortality is at least 30% within the first two years – the remainder become chronically infected with TB posing a threat to communities. Ensuring that all patients diagnosed with TB complete their treatment is, therefore, the key way to prevent MDR-TB.

Most countries, including South Africa, have adopted the WHO's goals of detecting 70% of all new sputum smear positive patients and successfully curing 85% of those detected (Department of Health, 2001). Since 1997, the cure rate nationally has slowly improved from 57% in 1997 to 63% in 2000 (Department of Health, 2002a). Interruption rates for the country are still high, with a small decrease from 19% in 1997 to 16% in 2000. The percentage of new smear positive pulmonary TB patients who die while on treatment increased nationally from 6% in 1997 to 8% in 2000 (Department of Health, 2002a).

The South African national TB budget is calculated to be approximately R500 million (US$50 million) per year, one third of which is spent on the management of MDR-TB, and 20% on the hospitalisation of patients (Department of Health, 2001). It has been estimated that, due to the dual TB/HIV epidemic, the total cost for the

NTCP will have to increase to at least R931 million in 2005 (Department of Health, 2001). It was estimated that the total cost of TB control in South Africa was around US$ 300 million in 2002 (Floyd et al., 2002). At present, South Africa receives some external assistance, but the government funds almost all of the costs of TB diagnosis and treatment. In 2003, the Global Fund Against AIDS, TB and Malaria awarded US$ 25.1 million for TB/HIV activities, to be implemented primarily through NGOs (World Health Organisation, 2004b).

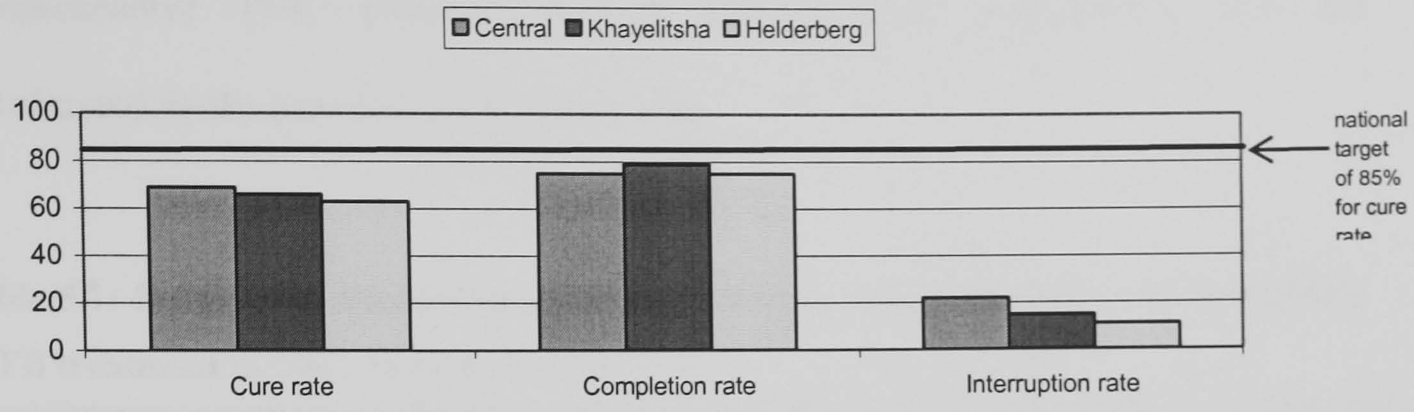
At the district level, the TB budget is sourced from within the district health system budget, with no extra resources sourced from outside. While staff costs are carried by the district hospitals and clinics, drug procurement is through the pharmacy services and budget. Tuberculosis drug supply is guaranteed, broadly based on the number of registered cases. There is no specific tuberculosis line item in the budget and no district plan to guide activities and budget allocation. While there is no dedicated national TB budget, the National Treasury provides funds for TB control along the several other health care programmes directly to provincial Departments of Health through the Equity Share Grant for Health. Provincial Departments of Health generally make allocations to TB control based on financial data from the previous year and manage the overall health budgets that are accessed by district health management teams (World Health Organisation, 2004b). According to the National Department of Health, the cost per TB patient in 2000 was R3 122 (Department of Health, 2001).

5.3.2 Public sector provision of TB treatment in the Western Cape

This section describes the organisation and availability of the public sector provision of TB treatment in the three study districts in the Metro health region of the Western Cape province. Khayelitsha is a peri-urban area consisting of informal and formal settlements. Overcrowding is a serious problem and unemployment is over 37% (Central Statistics Service, 1998). This area has grown significantly over the past few years and continues to grow. Helderberg is one of the smallest districts in the region consisting of urban and rural settlements. Informal settlement areas have grown significantly over the past few years. Finally, Central district consists of mainly urban areas where the choice of health service providers is the greatest, as the majority of private practitioners and private hospitals are located in this district.

Tuberculosis is the predominant communicable disease in the Western Cape. Tuberculosis was identified as a provincial emergency in 1997. One of the priorities in the late 1990s has been to accurately quantify the epidemic by improving the surveillance system through the implementation of TB registers. The cure rates have significantly improved in the province which was partly due to the improved service delivery in this area. Figure 5.1 shows treatment outcomes for new patients in the districts in the 2nd quarter of 2001 (Department of Health, 2002). For new cases, the cure rate was highest in Central district (69%) followed by Khayelitsha (66%) and Helderberg (63%). All the districts showed much lower cure rates than the nationally accepted target of 85%. The gap between cure rate and successfully completed treatment rate was the highest in Khayelitsha district (13%), closely followed by Helderberg district (12%), and Central district (6%).

Figure 5.1: Treatment outcomes for new cases, 2nd quarter 2001 in %



Source: Department of Health 2002b

With the intention to strive towards the universal provision of a defined, comprehensive package of care at all PHC facilities (mobiles, clinics, community health centres), local authority is given primary responsibility to provide basic PHC services, including TB services, within a district-health system. Besides treatment of acute cases, a comprehensive package of services includes health promotion and the prevention of diseases. Given high levels of unemployment and poverty, the comprehensive package is provided free at the point of delivery throughout the public primary health care system. The utilisation of primary health care facilities has increased by 27% in the period 1997-2000 (Department of Health, 2000b). The main emphasis on TB treatment in the Western Cape changed from hospital to ambulatory treatment over 20 years ago. Only patients with particular types of TB and particular problems are admitted to specialised hospitals in the province.

Table 5.1 gives a summary of the population size, number of TB cases reported, TB incidence rate, and HIV prevalence of TB cases, for each district. In addition, the table indicates the type and number of health facilities providing TB treatment in the districts. The municipal local authority is responsible for rendering preventive and curative services at fixed and mobile clinics. The mobile clinics render services to informal settlements according to a monthly schedule. The provincial administration manages community health centres. Tuberculosis services are provided within a comprehensive PHC package through district-based programmes that are coordinated by the provincial TB programme.

Table 5.1: Population, TB incidence, HIV prevalence rate in TB cases and availability of TB treatment in 2002, in each district

	Khayelitsha	Helderberg	Central
Population	325 600	138 310	381 361
Number of TB cases reported	1 376	594	666
TB incidence per 100 000	423	429	175
HIV prevalence rate in TB cases	39%	36%	23%
Health facilities providing TB treatment			
- fixed clinics	8	6	8
- mobile services	1	1	0
- community health centres	3	2	2

Source: Metro Region Control Programme, 2002

The majority of patients attending the health facilities are self-referrals who know the clinic by word of mouth or direct knowledge, having been treated before or investigated as a household contact. The main PHC providers are nurses, with doctors providing support on a daily, and more often weekly, basis. Most of the doctors have a sessional agreement with the local authority. The average nurse/patient ratio in all three districts is between 40 and 52, substantially higher than the accepted norm of 30 patients per nurse per day. The great disparities in nurse/patients ratios per day significantly impacts on the amount of time that can be spent on treating and counselling TB patients at facilities and ultimately affects the TB treatment outcome indicators for the districts. The clinical personnel at the health facilities have been trained in implementation of the revised NTCP. All of them provide a range of PHC services and rotate on a 3 monthly basis, except for the DOT nursing sisters who provide TB care for 6 months for the sake of continuity of care and bonding with the TB patient. All the clinics are part of a network that has access to the National Health Laboratory Service which offers microscopy, culture, identification and sensitivity tests.

5.3.3 Private sector provision of TB treatment

Private sector providers of TB treatment could be classified into three major groups:

1. the private for-profit health sector which includes contractor hospitals, private practitioners and private hospitals
2. employer-based health care providers
3. the non-profit private sector, represented by NGOs

Private for-profit providers of TB treatment

Two main private for-profit providers that provide TB treatment are contractor hospitals, and private practitioners/hospitals. South Africa has a long history of clinical contracting to for-profit private providers. In the case of contracting for hospital management, the annual value of the contracts accounted for 4.1% of total hospital expenditure in 1995 (Hospital Strategy Project, 1996). These contracts are specifically for services rendered, and exclude all purchases of goods, supplies and equipment. Clinical contracts awarded for hospital TB services are provided by Lifecare Group Holdings (Lifecare). Lifecare is a private-for-profit company, funded by the government to provide hospital TB care. The company provides TB care in 8 hospitals with 3 061 beds in four provinces. The contract with Lifecare was inherited from previous administrations. A number of different reasons appear to have influenced the decisions of the previous administrations to contract out the management of TB hospitals. In many cases, contracts have been so long-standing that the provincial administrations no longer have the capacity to provide certain services themselves and have thus become dependent on Lifecare for delivery of TB services (Key informant, National TB Control Programme).

The contract with Lifecare uses per-diem payment method, requiring the government to reimburse Lifecare retrospectively for the number of annual patient days delivered. Although the total government expenditure on Lifecare was R60 million in 2002 (Interview data), there was no indication whether or not the government was securing efficiency gains through contracting out TB services. As discussed in chapter 2, according to the theory of contracts, efficient contracts require a degree of symmetry in the distribution of risk between the parties (Arrow, 1985; Guesnarie, 1990). This argument is based on the assumption of some degree of asymmetry in information between the principal (government purchaser in this case) and the agent (contractor in this case), and on the further assumption that the agent will behave opportunistically and exploit the contract if given the space to do so. The Lifecare contract has been subjected to systematic review by the various provincial administrations which have taken them over. The key issue is that reports which used to be submitted to the provinces included information on the annual number of patient days which formed the basis for reimbursement, without giving any information on the outcome of patient care.

A study on the relative efficiency of contracting out versus direct provision of hospital services in South Africa by Broomberg et al (1997) found that for contracting out to generate efficiency gains the necessary conditions for an efficient contract must be in place. These conditions include strong government capacity to negotiate, implement and monitor contracts, adequate information on government's own production costs, as well as those of competitors, and the presence of actual or at least potential competition. The authors of the study argue that:

> "*the presence of these conditions will allow for the negotiation of fair contracts, with a symmetrical distribution of risk between the government and the contractor. Efficient contracts should also rely on reimbursement mechanisms which generate incentives for contractor efficiency, rather than perverse incentives such as prolonging length of stay*" (Broomberg et al, 1997; pp. 233-34)

Most of these conditions are not present in the contract with Lifecare. For example, the management and monitoring of the Lifecare contract has been weak. As one of the key informants explained:

> "*I think it is just management. I mean there is no doubt it is just management, and this has been going on for a long time and no one was querying because this was comfortable and maybe this was working well*" (Key informant, Gauteng)

Although Lifecare is going to continue providing TB services to government on a contracted basis in the future, a new contract which includes information on the outcome of patient care, is planned to be developed. In addition, reports will have to be submitted to provinces on a more regular basis (quarterly as opposed to annual reporting in the past).

The Medical Scheme Act (Act 131 of 1998), effective from January 2000, regulates medical scheme coverage for certain defined conditions in terms of prescribed minimum benefits (PMBs). Medical schemes are non-profit associations funded primarily out of contributions from employers and employees. The aim of the legislation is to prevent schemes that did not provide these minimum requirements from abandoning members to the public sector, thereby exhausting public hospital facilities. The minimum benefits may be covered by one network of hospitals, which includes public sector hospitals (Stein et al, 2002).

The prescribed minimum benefits for TB are part of the PMBs for the treatment and management of opportunistic infections in HIV/AIDS patients (Department of Health, 2000c). The PMBs place emphasis on counselling, testing for HIV and treating people with HIV for opportunistic infections such as pneumonia and tuberculosis. This includes screening and preventative therapy for these conditions. Across all medical schemes, 84% of beneficiaries have access to screening for TB and to preventative therapy for TB (Stein et al, 2002).

According to one of the largest medical schemes administrators in South Africa, most medical schemes cover in-hospital treatment for TB in situations when patients are admitted with a form of TB as an AIDS defining disease, e.g. TB meningitis or severe pneumonia, requiring hospitalisation. These patients are treated under the HIV benefit for the acute event. The treatment for TB is commenced, and after discharge the patients become the government's responsibility and are referred for further ambulatory treatment to a public clinic. Should a patient require long-term hospitalisation for very severe chest disease caused by TB (often associated with HIV/AIDS), medical care is provided in public sector hospitals. To summarise, medical schemes cover the cost of diagnosis of TB associated with HIV – the treatment is, however, still the responsibility of the government.

Although the private for-profit sector is responsible for more than half of the national expenditure on health, very little treatment for TB is provided by private practitioners as medical schemes do not cover TB treatment. According to one of the key informants:

> *"private providers are not interested in primary health care, including TB treatment, because there is no profit to be made. It's hospital procedures and specialist services that attract them"* (Key informant, Western Cape)

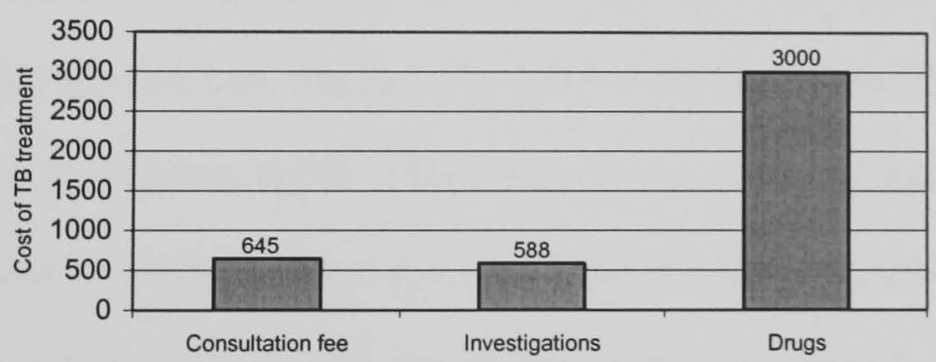
In the private practitioners' setting, patients diagnosed with TB are referred to the nearest public clinic. The three main reasons for referrals are as follows: (1) private practitioners do not have the necessary training in managing tuberculosis; (2) medical schemes do not cover TB treatment in an ambulatory setting because the TB treatment is free of charge in the public sector; and, (3) TB treatment in the private sector is costly for the patient and unprofitable for the provider. The exception to this is when patients insist on getting TB treatment from their private practitioners. In situations like this, the private practitioner initiates the TB treatment using combination tablets. A family member is asked to supervise the patient and keep the patient's records. The patient makes monthly visits to the private practitioner, more if there are side effects. It is the responsibility of the private practitioner to notify the provincial TB control programme of the TB patient under treatment in the private practice. According to a key informant, cases like this are very rare and, on average, around 10 to 15 TB cases a year are treated in the private medical centre where he works. Private practitioners refer approximately 99% cases to the public clinics.

> *"patients can get TB treatment in the private sector if they insist. However, they very quickly realise how expensive TB drugs are and make a plan. Most of them end up in the public sector"* (Key informant, Western Cape)

Since the provision of TB treatment in the private for-profit sector is minimal, the author estimated the potential, rather than actual, cost of managing a pulmonary TB patient from diagnosis to treatment completion, using 2002 prices. The author's calculations are based on the assumption that, during a 6-month treatment period: (1) TB patient is supervised by a family member; (2) TB patient makes 7 visits to a private practitioner (one visit for initial diagnosis and 6 visits for follow up); (3) there are no side-effects to the treatment; (4) investigations include 6 sputum smears, 1 culture, and 2 chest X-rays; and (5) TB drugs are purchased at a local pharmacy.

Figure 5.2 below gives a breakdown of the cost estimate. On average, it costs around R4 300 to treat a new pulmonary TB patient in the private sector. The highest cost component of the TB treatment is the cost of drugs (R3 000).

Figure 5.2: Estimated total cost of managing a new pulmonary TB patient from diagnosis to completion of treatment in the private for-profit sector, Rand 2002



Whilst investigations and consultations may be covered by medical schemes, the entire cost of TB drugs is borne by the patient. The availability of TB drugs in the private sector can also be problematic, as local pharmacies usually do not stock TB drugs. In many cases, TB drugs must be ordered in advance which delays the start of the treatment.

Employer-based provision of TB treatment

Some private companies in South Africa provide and fund on-site health services for their employees, ranging from limited primary and/or occupational health care in non-mining companies, to comprehensive health care (from primary health care through to specialist hospital referral services) on the mines. The mining industry is one of the most important industries in the South African economy. Although the numbers of employed in the South African mining industry have decreased substantially over the past twenty years, it remains a major employer in South Africa, with just under 400 000 people in service in the year 2000 (Guild et al., 2001).

According to the notification to the Chamber of Mines South Africa, TB incidence rates have increased dramatically. In 1997, the incidence rate among gold miners reached 3 000 per 100 000, compared to under 1 000 per 100 000 in the early 1990s (Churchyard and Corbett, 2001). Although the increase has occurred among workers on all the main commodity mines (i.e. gold, coal and platinum mines), TB incidence rates among silica-exposed gold miners are about 3 to 4 times higher than in non-silica exposed platinum miners, and almost 10 times higher than those among the general population (Corbett et al, 2000).

Among miners the increase in TB incidence notification rates has occurred in parallel with the increasing prevalence of HIV infection. It was estimated that up to

30% of mineworkers in certain mines may be HIV positive (Guild et al, 2001), and that the proportion of HIV associated TB among miners exceeds 50% of all TB cases in this group (Churchyard and Corbett, 2001). Migrant labour and single sex hostels have contributed to the spread of sexually transmitted infections and HIV, both in neighbouring residential communities and in remote rural areas. TB associated mortality, including deaths from HIV associated opportunistic infection, exceeded deaths from mine accidents among gold miners for the first time in 1996, and is the leading cause of death amongst gold miners (Churchyard and Corbett, 2001). It can be expected that TB incidence rates among miners will continue to increase during the next decade unless effective control methods can be identified and implemented. In addition to HIV infection, silica inhalation and silicosis are potent risk factors for TB, particularly among gold miners.

According to the main acts that regulate financing and provision of TB services on the mines, mining companies are responsible for ensuring TB surveillance, treatment and notification, and in cases of possible chronic lung damage, for the assessment of impairment and submission of cases for compensation. There is a long history of provision of TB treatment in the mining industry. According to the regulatory framework, employers are required to cover the cost of TB services for their employees. Some mining houses provide medical services, including TB services, in-house, whilst other companies contract these services out to managed care companies. The managed care companies are paid on a capitation basis by the employer to provide a comprehensive service to lower income groups of employees. Higher income employees contribute to medical schemes and can choose health care providers.

Like the majority of employer-based health services, mining companies generally do not provide health care services for the wider community (i.e. people other than the companies' employees and their dependents). Some companies provide health care services to other mining companies, including contractors, on a fee-for-service basis. The mining health services generally do not refer TB patients to public sector facilities. The only exception are employees who resign and become the state's patients, and contract workers working on the mine who are not employees of that particular company but are contracted and the contractor does not pay for non-work related injuries and illnesses. The latter category of miners depends on public health services delivered to 'informal settlements', and shows high treatment interruption rates (Key informant, Chamber of Mines).

Since the great majority of miners still live in hostels, where they usually share a room with other miners, some mining health services admit all sputum positive patients until they become sputum negative. After two weeks of hospitalisation, or longer depending on the particular patient, patients are discharged back into the residence community at the mine's shaft, and their treatment is carried on at the shaft clinics. In most cases, however, patients are not admitted at all and both the investigations and treatment are provided on an outpatient basis. Regardless of whether patients are admitted or not, professional nurses or nursing category employees administer the treatment under direct observation. The proportion of miners who successfully complete TB treatment is high, with treatment interruption and failure occurring uncommonly (Key informant, Chamber of Mines).

TB control programmes in the mining industry have two major objectives: early detection and cure of infectious cases, and prevention of drug resistance (Churchyard and Corbett, 2001). In addition to passive case finding of TB cases, advocated as the only method of case detection according to the NTCP guidelines[2], South African miners are one of the few communities in the world in which routine radiography is practiced. Although the proportion of TB cases detected by the radiological screening programme has declined because of the fact that miners with HIV associated TB are more likely to self-present, a substantial number of TB cases are still detected on routine x-ray screening (Churchyard et al., 1999).

As far as TB diagnosis and treatment are concerned, the mining companies have a standard which exceeds what is considered to be acceptable to the National TB Control Programme. It has been recommended that, in addition to the NTCP guidelines as the minimum standard required for TB control, the mining company follows the guidelines developed by the Chamber of Mines in its document, Practice Standards for the Management of Patients with Pulmonary TB on Mines (Chamber of Mines, 2000). According to Churchyard and Corbett (2001), these guidelines are evidence based as far as possible or based on best practice in the industry. The main differences between the NTCP and Chamber of Mines' guidelines are outlined in Appendix II. The most important ones are that (a) the mining population is routinely screened at least annually (active case finding); (b) TB patients' contacts are traced; (c) all smear positive TB patients are hospitalised for at least 2 weeks; and, (d) chest x-ray is used on all patients irrespective of whether the first smear is positive or negative.

[2] Active case finding is expensive, and requires access to an efficient TB treatment programme in order to be effective.

Non-profit private providers of TB treatment

There has been a long history of NGOs working in the South African health sector. A large NGO, the South African National Tuberculosis Association (SANTA) owns and manages 22 hospitals (5 018 beds) located in most of the provinces in the country, in which it provides TB treatment to publicly funded patients. In 2002, the total amount paid by the provinces to the NGO amounted to R102 million (Interview data), which is approximately 20% of the government's TB budget. SANTA is reimbursed on the basis of an agreed tariff per patient day, which varies between different hospitals. Under the arrangement, the NGO does not incur any losses, nor make any profits, and the government funds any deficits. This situation clearly places the burden of risk on the government side, and creates poor incentives for efficiency on the part of SANTA. The agreed tariff per patient day in 2001, averaged across all the hospitals, was approximately R90. The price charged by SANTA covers only 'hotel fees', since the government separately funds drugs, other medical supplies and transport.

The relationship between the provincial department of health and the NGO dates back to a verbal agreement reached in the 1950s. The 'contract' remains in the form of a 'gentleman's agreement' between the two parties. Under the terms of this agreement, the NGO provides two services to the government. Its primary service is the provision of hospital care to TB patients. In 1993, it started providing community-based TB services through its voluntary branches country-wide.

As with the Lifecare contracts, it is difficult to identify any explicit rationale for the existence or nature of the SANTA agreement - other than historical. Some provincial health administrations have expressed concerns and dissatisfaction with quality of care provided by the SANTA hospitals, as well as on the clinical approaches used, and on the relationship between these hospitals and the rest of the public health system. The concerns seem to emerge from a perception that the 'contract' is based on an outdated model of TB care, in which patients are hospitalised for lengthy periods. Approaches focus on supervised outpatient treatment close to the patient's home, thus reducing the need for a large-scale in-patient capacity, which is often sited at long distances from where patients live.

In 2000, the National TB Control Programme, with technical and financial support by the UK Department for International Development, conducted a review of services provided by SANTA. Although the results of the review are still confidential, indications are that some provinces will take over SANTA hospitals, convert them to step down facilities, and use the existing infrastructure for managing terminally ill HIV/AIDS patients (Key informant, National TB Control Programme).

5.3.4 Existing public-private partnerships for TB treatment

Whilst the great majority of TB services in South Africa are provided in the public health sector, almost all the provincial TB control programmes have partnerships for directly observed TB treatment with non-profit and/or for-profit private providers. This section describes the characteristics of different existing public-private partnerships in the three study provinces.

Partnerships with the non-governmental organisations in the Western Cape

The NGO sector also plays a vital role in TB treatment at the community level, where lay workers, usually volunteers, are increasingly being used as DOT supporters. The government has recognised that NGOs have an important role to play in the NTCP, as they add value by making treatment more accessible to TB patients through various strategies and programmes, including community-based DOT.

> *"they are the backbone of our DOT support system and basically it is on a community-based level and they have three functions in our province. The one is health education, the second one is to do the follow up of the interrupters, and then the third one is to be a DOT supporter"* (Key informant, Western Cape)

The provincial departments of health have developed a good working relationship with many of them especially in the priority areas of TB and HIV. The lay workers, TB treatment supporters form part of the PHC team that operate external to the public health system. In addition to their service delivery, the NGOs provide an important link between the formal public health services and the community. Most of the NGOs involved in the community TB programmes are concentrated in the Western Cape where the community-based TB treatment was initiated with the training of DOT supporters by local NGOs in the early 1990s. At the time of this study, there were six NGOs and 1 200 trained TB treatment supporters providing community-based TB treatment in this province. DOT supporters are active in most of the health facilities in the Western Cape, and their services are firmly linked to the health services.

Although there is a long history of NGOs involvement with TB (some NGOs go back to the 1920s and 1930s), it is only since the advent of the revised TB control programme in 1995 that the emphasis was on supervision of patients in community-based programmes. On the other hand, the NGOs have changed the focus and the service they provide, and realised that they cannot work in isolation and provide TB services without the support or integration with the public clinics.

In 1996, the Metro region in the Western Cape started building relationships with the NGOs on a collaborative basis - both institutions tried to find ways to assist each other in providing services to TB patients. After piloting and evaluating the community-based programmes, and prompted by the increasing number of TB patients in the region, the region decided to formalise relationships with two largest NGOs through a memorandum of agreement. According to the memorandum of agreement, the region pays an agreed sum per patient per month to the NGO to manage a community-based programme. This money is used to pay an incentive to the treatment supporters. In addition, the region pays towards the salary of the district co-ordinator, the training and general administration costs of the NGO. Duration of the agreement is one year renewable, and the NGOs have to reapply for funding each year. The region assesses the previous year and renegotiates the funding for the next year. Due to the small number of NGOs involved in TB care, the initial agreement was directly negotiated. Since working with the private providers on TB DOT is a fairly new phenomenon, there have been no guidelines on delivery of TB services in the private sector,[3] and the province had to develop a memorandum of agreement for the partnership with the NGOs from scratch.

[3] At the time of this study, the guidelines on working with the private sector were being developed.

The objective of the partnership is to give TB patients the options of where they want to be supported for the duration of their treatment, and to improve compliance because service could be rendered nearer to where the patients live. As one of the key informants explained:

> *"the onus really rest on the client (patient) where and how they would actually like to be supported for the duration but it is to give that leeway and not have it very strict and rigid and no other options to patients"* (Key informant, Western Cape)

Another view is that the objective of the partnership is to involve the community to take the ownership of the TB and HIV problems in their community:

> *"for as long as they perceive it to be a health problem which belongs to the government we are not going to make any headway at all. The community has to be empowered to understand that they are part of the solution to the problem"* (Key informant, Western Cape)

The responsibilities of the NGOs are to efficiently and effectively manage funds that are given to them, recruit, train and manage treatment supporters with the community, and finally, to liase with the public clinics in the managing of the people they have recruited to support patients in the community. Monitoring procedures include quarterly reports submitted by each NGO to the regional office, detailing a financial statement and proof of payment of all expenditure related to the funding received from the regional office, the number of treatment supporters, the number of TB patients supervised in community-based programmes, and information on training of the treatment supporters. The reports are completed by hand on a standardised form.

One of the NGOs is also involved in supporting TB programmes in the workplace, where TB patients are supervised by a colleague at work, a treatment supporter trained by the NGO. However, this supervision option is not widely used and only a small number of patients choose this option. Table 5.2 shows a percentage of registered TB cases in the study districts by type of supervision in the 2nd quarter of 2002.

Table 5.2: Percentage of registered TB patients by type of supervision, 2nd quarter 2002

DOT option	Khayelitsha	Helderberg	Central
Community DOT	30%	44%	12%
Clinic DOT	61%	48%	55%
Workplace DOT	3%	4%	10%
Family member DOT	6%	4%	23%

Source: Department of Health, 2002

Quite a high proportion of registered TB patients were supervised in community programmes, ranging between 30% and 44%. Whilst Khayelitsha district had a lower percentage of patients supervised in the community, the actual number of patients was higher than in Helderberg district. The main reason for this is a greater availability of treatment supporters in Khayelitsha district with predominantly peri-urban areas where community-based NGOs manage several community-based TB programmes. Workplace supervision option was the least favoured by the TB patients, with only 3% to 10% choosing this supervision option. The region's medium term development plan is to have 50% of all the registered TB cases supervised in the community, including workplace. Of all the districts, Helderberg was the closest to the region's target rate, having 48% of all the patients supervised in the community (including workplace) in 2002.

Partnerships with the mining health services in the Free State and North West

Historically, the mining industry in South Africa has received subsidies from the government to treat TB patients in their facilities. The government's reasons for subsidising the mining industry are many. Firstly, since it employs a large number of people, the mining industry has an important role to play in the South African economy. Secondly, the government recognises that the industry needs to fulfil the legal requirements where TB in a mine setting is an occupational disease and the mining companies are obliged to identify and treat TB patients. Thirdly, the public sector does not have health facilities on the borders of the mines to manage such a huge number of TB patients. Even if the miners were using public sector facilities, their shift working hours do not coincide with the opening times of the public clinics. Finally, in South Africa, employer-based model is a common model of providing health services and a significant source of health care. In both North West and Free State, the mining industry health services treat almost 10% of all registered TB case.

At the time of the study, there were partnerships with two platinum mines' health services in the North West and partnerships with two gold mines' health services in the Free State. In addition, there was a health services provider contracted by a gold mining company in the North West that was not working closely with the provincial TB control programmes but was seen as a potential partner.

The subsidies used to be paid per TB patient per day, on a reimbursement basis, and the mining health services provided TB treatment according to their own protocol. Several years ago, the North West discontinued the subsidy system and replaced it with a system where mining health services get TB drugs for each TB patient registered and treated by them. The Free State continued with the subsidy system. The subsidy amount has not been increased for years and it only covers a small fraction of cost of TB treatment provided by the mining health services.

There are two main reasons for providing the mining health services with the free drugs in the North West. First, the TB incidence rate on the mines is the highest in the country and is contributing to the epidemic. Second, it is in the interest of the provincial TB control programme to have TB epidemic under control. In return for the free drugs/subsidy, the mining health services must follow the national treatment guidelines, complete quarterly reports using a standardised form and submit them to the district TB coordinator, and interact with the district health facilities. Only those mining health services that comply with the North West TB Control Programme's requirements receive free TB drugs.

The partnership with the mining health services is very informal, without a written agreement in place. The provincial TB coordinator and the representative from the mining side meet on a quarterly basis to assess the situation in the previous quarter, and make plans for the next one. From the provincial TB control programme's perspective, the main objective of the partnership is to integrate TB treatment activities in the mining sector into the TB programme with the main aim to correctly manage TB and get TB patients cured. From the mining health services viewpoint, the objective of the partnership is early identification, high cure rate, compliance with the national guidelines and delivery of a cost effective service, which includes getting free treatment/subsidy from the government.

The interaction between the mining health services and the government is very important for both stakeholders, and it works well.

> "*we know what they want and they know what we want. And if you want your programme to be successful, if you want to combat the disease, you have to combat it in all areas. If you are going to just do your own thing around here and they don't know what we are doing, I don't think that can work*" (Key informant, North West)

Partnerships with occupational health services in the Western Cape

Many occupational health services in the Western Cape have agreements with their local authority TB services to provide directly observed TB treatment at work. According to this agreement, the public clinic is responsible for investigations and TB drugs, and the occupational nurse supervises TB treatment daily at workplace. The cost of TB treatment is therefore split - while the cost of the occupational nurse is borne by the employer, the government covers the cost of the drugs and investigations. A private occupational physician has a contract with the employer to provide primary care and occupational health at the factory clinic twice a week.

Partnerships with private practitioners in the Free State

Although private practitioners tend to refer their TB patients to the public sector, there are examples where private practitioners are involved in the provision of TB treatment in a partnership with the district health services. In the Free State, the provincial TB programme has trained 293 doctors on the NTCP guidelines throughout the province in the last four years, and some of them are doing DOT in their consulting rooms.

The district TB coordinators generally have a very good relationship with the private practitioners. For example, in some cases, TB patients diagnosed in the private sector prefer to take their medication at home. In this case, the patient gets a monthly supply of drugs from the public clinic, and the doctor takes the responsibility for following that patient throughout the treatment according to the national guidelines. The doctor is asked to report the outcome to the district TB coordinator.

Although most of the key informants think that partnerships with private practitioners need careful monitoring, there is hope that more private practitioners will follow the national guidelines and treat their patients accordingly. As one of the key informants explained:

> *"...we are very strict. When they send a patient to the clinic they know they must follow the national guidelines. But on the other side, I also want to protect my doctors because we can't run a TB programme without the cooperation of everyone so I try to have an open relationship"*(Key informant, Free State)

Partnerships with traditional healers in the North West

Traditional healers enjoy considerable status with a high degree of acceptance by majority of the South African population. They generally live within their communities and are more easily available and accessible than the allopathic health services. Types of traditional health practitioners can be broadly categorised as diviners, herbalists, faith healers and traditional birth attendants. There are an estimated 150 000 to 200 000 traditional healers in South Africa (Pretorius, 1999) and they are represented by the Council for Traditional Healers. Although there is entrenched historical bias towards western/allopathic health care, the government has committed itself to the involvement of traditional healers in official health care services.

In order to cope with the increasing numbers of TB patients, the TB control programme in the North West has developed good working relationships with around 1 000 traditional healers. The traditional healers are integrated into the existing community-based TB DOTS programmes, where options for supervision consists of the local health clinic, community health workers, lay people, and traditional healers. They are working closely with the district clinics and are involved in identifying TB suspects and supervising TB patients.

5.4 Conclusion

This chapter has described the nature of TB treatment delivery in South Africa, focusing on the characteristics of different service providers and interaction between these providers. It has also reviewed different partnerships between public and private providers of TB treatment. The four main TB treatment providers are: (1) the NTCP operated by and through public health services at district level; (2) the mining industry TB services provided either in-house or contracted out to managed health care companies; (3) contracted out private-for-profit hospitals; and, (4) the non-profit non-governmental organisations providing community-based TB treatment. The public health sector is predominant in the provision of TB care across the country.

A rapid increase in the detection of TB in a high HIV/AIDS environment and the emergence of MDR-TB has led the national and provincial governments to identify TB as a priority. With the intention to strive towards the universal provision of a defined, comprehensive package of care at all PHC facilities, local authority is given primary responsibility to TB services within a district-health system. Besides treatment of acute cases, a comprehensive package of services includes health promotion and the prevention of diseases. Given high levels of unemployment and poverty, the package is provided free at the point of delivery throughout the public primary health care system. As a result, medical schemes do not cover treatment for TB, and patients who are diagnosed in the private sector are referred to the public sector facilities.

Different partnerships exist between the providers of TB treatment in the public and the providers of TB treatment in the private for-profit and non-profit sectors. Amongst the non-profit private providers, both formal and informal partnerships exist between the provincial Departments of Health and individual NGOs. The government has recognised that NGOs have an important role to play, as they add value to the NTCP by making treatment more accessible to TB patients through various strategies and programmes, including community-based DOT. Partnerships between the for-profit private providers, such as the mining industry health services, and the provincial Departments of Health are informal and historical. Informal partnerships between the provincial Departments of Health and private practitioners/hospitals are emerging. The next two chapters examine the performance of two public-private partnerships: a partnership between the provincial Department of Health and NGOs providing community-based DOT, and a partnership between the provincial Departments of Health and mining companies. Public provision of TB treatment is also included as a model, since expanding direct provision represents an alternative to partnerships.

Chapter 6

SELECTION OF PUBLIC-PRIVATE PARTNERSHIP MODELS AND QUALITY OF CARE FOR THE TREATMENT FOR TUBERCULOSIS

6.1 Introduction

Chapter 5 has described the nature of TB treatment provision in South Africa. It identified and described the main providers of TB treatment, their roles and responsibilities for TB treatment, and partnerships for directly observed TB treatment that exist between them. Although the predominant provider of TB treatment is the public sector, the private for profit sector, through employer-based health services, and private non-profit sector, through community-based DOT, make a significant impact on the delivery of TB treatment in the country. Some of these private providers, such as NGOs, work closely with the public sector facilities and are subsidised by the provincial Departments of Health to provide services on behalf of the government. Others, like the mining companies, are bound by law to provide TB treatment to their employees and are also subsidised for reasons discussed in the previous chapter.

One of the main aims of the study is to evaluate the performance of different models of public-private partnerships in the delivery of TB treatment, and to provide a comparison between these models and a purely public model of TB treatment. The aim of chapters 6 and 7 is to explore whether, in light of the TB/HIV epidemic, increased collaboration with private providers through partnerships could potentially improve the quality of care and cost-effectiveness of TB treatment. For the analysis in chapters 6 and 7, a common evaluative framework is used to assess the performance of PPP models and a purely public sector model. It examines the following:

1. Quality of care in terms of structure, process and outcome.
2. The average costs of TB treatment. Costs are disaggregated by different dimensions of TB treatment (e.g. diagnosis, DOT, monitoring) and compared to assess technical efficiency. In each evaluation, costs are considered from the perspective of health services providers, the tuberculosis programme, NGOs involved in tuberculosis care, and patients.
3. Effectiveness is measured using two measures of effectiveness: cure rate and successful treatment completion rate. Judgements on allocative efficiency are based on a cost-effectiveness analysis (cost per patient cured and cost per patient successfully treated).

In evaluating the performance of two examples of partnerships for TB treatment, the research aims to address both the question of "in terms of quality of care of TB treatment, how well do these models work?" and seek answers to "why it this so?" By seeking to answer both "how" and "why" questions, the research described here was both exploratory and explanatory. To achieve the above aims, and following from the concepts highlighted by the initial literature review, a series of research questions are posed for each model of service delivery:

1. In terms of quality of care of TB treatment, how well do these models work? What is the technical, process and outcome quality?
2. What is the nature of the factors potentially impacting on quality of care?
3. How do these models compare to the public sector providers of TB treatment?

This chapter starts with the methods, focusing the research process by giving details about data collection, definition, selection and justification of PPP models, site selection, and methods used for measuring quality of care. Findings on different components of quality of care evaluation, the nature of the factors potentially impacting on quality of care, and sensitivity analysis results are then presented for each study site, and overall for each model of delivery. Chapter 7 presents the methods and results of performance of these models in terms of cost-effectiveness.

6.2 Methods

This section describes the research process and methods used for evaluating quality of care. Details about the fieldwork, PPP model selection, and site selection are first given. Description of the objectives, tools and methods used to conduct the individual components of quality of care assessment are then presented.

6.2.1 Research process

Data collection was undertaken between March 2002 and February 2003. Written consent was obtained from all the study providers (see the written consent form in Appendix III). Each facility delivering TB treatment within a model of provision of interest was visited during this time. Over a period of two to three days data were collected for a comprehensive cost-effectiveness and quality of care evaluation for each site.

To gain permission for the research each provider was contacted individually and asked whether he/she would be willing to participate in the study; all were keen to agree. The study was described as a joint undertaking between the University of Cape Town (UCT) and the London School of Hygiene and Tropical Medicine (LSHTM), funded by the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases. Ethical approval was also obtained from both the UCT and the LSHTM. All the providers were assured that no facilities would be identified. The clinics themselves were only contacted at a later date to make logistical arrangements, once they had been informed that the study would take place, following consent by the provider. The author played the major role in the data collection and analysis.

All data collection instruments were piloted in a public sector clinic in the Western Cape in February 2002. After piloting, semi-structured provider interview schedules needed to be modified by adding more "probing" questions for better understanding of some of the questions, and by taking out questions which were not within the scope of the research and therefore focusing on the most relevant issues.

6.2.2 Selection of models

In chapter 5, different existing partnerships between public and private providers of TB treatment were reviewed. Amongst the non-profit private providers, both formal (in the Western Cape province) and informal (in other provinces) partnerships exist between the provincials health departments and individual NGOs. Partnerships between the for-profit private providers, such as employer-based service providers, and the provincial health departments are informal and historical. Informal partnerships with private practitioners and traditional healers are emerging. In addition, the government has contracts with the for-profit company Lifecare and with the non-profit provider SANTA. These long-standing contracts reflect a historical tendency of the South African government to rely on private providers for health services where government capacity was lacking.

Using purposive sampling, the following existing public-private partnership models were chosen for the study:

1. Public – private for-profit partnership model. Employer based private providers were selected as they are a significant source of health care in South Africa. Specifically, mining companies were selected, as there is a long history of TB treatment in the industry. TB incidence is up to 10 times higher in the mines relative to the general population, due both to occupational TB hazards and very high HIV prevalence rates among mine workers. Historically, the mining industry in South Africa has received subsidies from the government to treat TB patients in their facilities. In return for the free drugs or a subsidy, the mining health services are expected to follow the national treatment guidelines, complete quarterly reports using a standardised form and submit them to the district TB coordinator, and interact with the district health facilities. The partnership with the mining health services is very informal, without a written agreement or formal contract in place.

2. Public – private non-profit partnership model. NGOs were selected as the services that they provide represent an important complement to the public sector provision of TB services. NGOs have an important role to play, as they add value to the NTCP by making treatment more accessible to TB patients through various strategies and programmes, including community-based DOT. The government has a formal relationship, through a memorandum of agreement, with NGOs involved in the community-based supervision of TB treatment. According to the memorandum of agreement, the government pays an agreed sum per patient per month to the NGOs to run a community TB programme. The programme involves supervision of TB treatment using lay workers "treatment supporters", health education and advocacy, and training. The duration of the agreement is one year and renewable, and the NGOs have to re-apply for funding each year. Due to the small number of NGOs involved in DOT of TB, the initial agreement was directly negotiated with the NGOs that were already involved in the provision of TB treatment.

These models are then compared with purely public provision of TB treatment. In order to provide comparisons to the public-private models, and because expanding direct provision represents a real alternative to partnerships, purely public provision of TB treatment was included as a model. Table 6.1 below summarises the main characteristics of different PPP models chosen for this study.

Table 6.1: Characteristics of study models

PPP model	Type of private provider	Type of subsidy	Population served	Components of TB treatment provided by the private provider
Public-private for profit	Employer based providers in the mining industry	Drugs or a subsidy per patient	Low income workers	All
Public-private non-profit	Community-based non-governmental organisations	Agreed monthly sum per patient	Community members	Observing patients take the medications and defaulter tracing
Purely public	Public sector providers	N/A	Local residents	N/A

As discussed in chapter 5, employer-based private providers and NGOs make an important contribution to the provision of TB treatment in South Africa, and the models chosen for the study therefore best represent the situation. The justification for using three models as case studies was that they complement each other by demonstrating a range of models of provision over a cross-section of settings. This would shed light on the influence of different factors on the overall nature of the models of provision.

There are several reasons for not choosing these providers as the study models of PPP. First, the policy in South Africa is moving away from hospital-based TB care to ambulatory and community-based care. The concerns seem to emerge from a perception that the contracts with both Lifecare and SANTA are based on an outdated model of TB care, in which patients are hospitalised for lengthy periods. New approaches focus on supervised outpatient treatment close to the patient's home, thus reducing the need for a large-scale in-patient capacity, which is often sited at long distances from where patients live. Second, relative efficiency of contracting out to Lifecare versus direct provision of hospital services has already been assessed (Broomberg et al., 1997). Third, both the Lifecare and SANTA contracts have been subjected to systematic review by the various provincial administrations. As discussed in chapter 5, there are concerns with quality of care provided, and efficiency of the clinical approaches used, by these contractor hospitals.

Models with private practitioners, and especially with traditional healers, were quite limited which was the main reason for not selecting them. However, these emerging models of PPP remain a viable option for the departments of health to consider in the future.

6.2.3 Site selection

For each type of provision model, 2 sites were selected (Table 6.2). Sites were selected by purposive sampling according to different delivery models, urban-rural locations, and willingness to participate in the study. Differentials among sites in terms of TB incidence and HIV prevalence reflected the variation in target populations reached by the PPPs. Sites were identified using key informant interviews with Provincial TB Programme officials. For the public-private for-profit model, two occupational health clinics in different mining companies were selected from adjacent provinces to capture differences in reimbursement mechanisms (per patient day or drugs). In addition to sputum smears, public-private for-profit sites also used sputum cultures and chest x-rays for TB diagnosis. In both sites treatment was observed by clinic staff and in site 1 all sputum-positive patients were hospitalised for the first 7 days. For the public-private non-profit model, two clinics in the Western Cape province where NGOs have a long history of providing community-based TB treatment and social support were chosen in township locations where the NGOs tend to operate. Two clinics (urban and rural) in the Western Cape province were selected for the public model. These sites were selected to represent typical services in rural and urban areas comparable to those served by the public-private models of provision. Data from these purely public sites were drawn upon as comparisons to the public-private models.

The sites were also selected to represent similar HIV prevalence amongst study populations. Sources of data for the estimated HIV prevalence were annual occupational medical reports prepared by the medical services in the mining companies, and the Western Cape's TB Working Groups' reports for selected districts. Since HIV+ patients usually get extra pulmonary TB, and HIV prevalence is greater on the mines than in the community, sites that have similar HIV rate amongst TB patients were selected. However, one of the limitations of this study is the fact that HIV rate is generally higher in the mining population than in the community.

Table 6.2 overleaf summarises the major characteristics of the sites selected for performance evaluation. The public-private for-profit study sites were two occupational health clinics in two mining communities, Site A in North West and Site B in the Free State. The public-private non-profit sites were two clinics working closely with two NGOs in the Western Cape Town (Sites C and D). Finally, the pure public sector sites were two clinics in the Western Cape (Sites E and F).

The findings of the quality of care evaluation in the sites were compared in the context of the national TB treatment guidelines, regarded as the gold standard in this study. This whole study focuses on new smear-positive pulmonary tuberculosis cases for several reasons. First, the DOTS strategy in South Africa focuses primarily on improving the cure rate in new infectious patients. The past efforts by the provincial TB Control Programmes have shown that by doing so the standard of the whole Programme is lifted and cure rates for other categories of TB patients also improve (Department of Health, 2001). Second, although HIV-positive patients have an increased risk of smear-negative and extra-pulmonary TB, the majority of them get smear-positive pulmonary TB (Department of Health, 2001). Finally, the national as well as provincial TB Control Programmes usually report on smear-positive pulmonary TB cases and data on other types of TB is not easily available.

Table 6.2: Key characteristics at each site

Site codes	Public-private for-profit		Public-private non-profit		Purely public	
	Site A	Site B	Site C	Site D	Site E	Site F
Type of provision	Private for profit	Private for-profit	Private non-profit	Private non-profit	Public	Public
Type of facility	Occupational health clinic	Occupational health clinic	Health clinic working closely with a local NGO	Health clinic working closely with a local NGO	Health clinic	Health clinic
Location	Rural town in North West	Small rural town in the Free State	Urban township[a] in the Western Cape	Rural township in the Western Cape	Small rural town in the Western Cape	Urban city area in the Western Cape
Incidence of new smear-positive pulmonary TB per 100 000 population[b]	1 073	3 012	439	149	169	176
Approximated HIV prevalence in the study population[c]	(approx) 44%	(approx) 48%	(approx) 39%	(approx) 36%	(approx) 29%	(approx) 23%
Overall TB service range	Surveillance for TB, diagnosis and treatment	Surveillance for TB, diagnosis and treatment	Diagnosis, treatment, and social support (e.g. soup kitchen)	Diagnosis, treatment and social support (e.g. soup kitchen)	Diagnosis and treatment	Diagnosis and treatment
DOT system in place	DOT by professional nurses at the hospital for the first 7 days followed by DOT by professional nurses at the occupational clinic	DOT by professional nurses at the occupational clinic	DOT by professional nurses at the clinic for the first 10 days followed by DOT by lay worker "treatment supporters" in the community or professional nurses in the clinic	DOT by professional nurses at the clinic for the first 10 days followed by DOT by lay workers "treatment supporters" in the community or professional nurses in the clinic	DOT by professional nurses in the clinic	DOT by professional nurses in the clinic

[a] Townships: formal and informal settlements in peri-urban areas. [b] Source for TB prevalence: providers' annual reports. [c] Approximated by the clinic staff as no specific prevalence studies undertaken in clinic target populations.

6.2.4 Methods for measuring quality of care

Donabedian (1980; 1985) distinguishes between technical and interpersonal aspects of quality health care and between quality of structure, process and outcome with respect to each aspect. The technical aspects of quality of care concern the physical manipulation of material things (e.g. cleanliness, adequacy of physical facilities, treatment appropriate to standard guidelines). Interpersonal interventions are just as important as technical ones but are much less predictable in their impact. They include politeness, privacy, choice, and information given in a comprehensible manner.

In this study, the three Donabedian's dimensions of quality of care - *structure*, *process* and *outcome*, and the relationships between them, were assessed (Donabedian, 1980). *Structure* is frequently taken to mean the resources in the health care system including the number, type and training of professionals, the building and equipment available, the materials supplied, and the cash devoted to care. Donabedian (1987, p76), however, defines *structure* as 'the more subtle features of organisation: differentiation, coordination, power, specification of work, procedures, and visibility of consequences. *Process* refers to the actual delivery of care, and includes access, diagnosis, treatment interventions and their administrative and technical support, discharge and community after-care arrangements, and health promotion and education activities. *Outcome* is defined as the end result of care. It includes health status, improvement in function, longevity, comfort, and, more broadly, quality of life.

Yin (1994) identifies six possible sources of data for case studies: interview, direct observation, participant observation, archives, physical artifacts and documents. Specific methods used for the case studies reported here were semi-structured interviews, direct observation and record reviews. Table 6.3 summarises the objectives, tools and methods used to conduct the individual components of quality of care assessment. A more detailed description of the methods used for the assessment of the quality of care follows the table.

Table 6.3: The aims, tools and methods used to measure quality of care

Objective	Tools	Method
1. To measure the technical quality	Definition of standards for a range of technical criteria (see Appendix IV)	Technical quality checklist of buildings, equipment and medical supplies available completed, and semi-structured interview with facility manager conducted, at each site and analysed quantitatively. Direct observation of the way in which the facilities visited were run or delivered services informed the interpretation of much of the data.
2. To assess the process quality	Interview with health care providers to collect information on technical quality of care - the provider's knowledge of the TB treatment guidelines, and type of information given to TB patients.	Semi-structure interviews were conducted with doctors, nurses and TB treatment supporters from study facilities.
3. To assess the outcome quality (treatment outcome)	TB patient record reviews were used to analyse the quality of treatment offered to TB patients. Record reviews were conducted to (a) assess (a) adherence to TB treatment, and (b) treatment outcome.	Retrospective reviews of TB patient records were conducted at each site.

The quality of care assessment adopted a modified evaluation approach from Rispel et al (1996) and combined several data collection tools for qualitative and quantitative information. These data collection tools were adapted versions of questionnaire designed for a study on contracting PHC services to private providers in Southern ca (PRICON study[1]) (Mills et al., 2003). Drawing on the literature review in ter 2, criteria or specific attributes of the TB service (i.e. specific elements of TB that should be present at the facilities) were identified for evaluation. A proposed of criteria as indicators of quality was then compiled and discussed by health ice professionals and academics who together had extensive experience in the h African health services. Based on their comments, the author finalised the list riteria. The degree to which these criteria were present in each of the sites was assessed in a combination of ways, using qualitative and quantitative analysis through a composite scoring method (see Appendix IV for scoring method).

hods used for assessing technical quality

nnical quality was assessed via a technical quality checklist, a semi-structured rview with the facility manager, and direct observation. For each site, one klist and one manager's interview were completed. Justification for conducting interview with the facility manager is the fact that each facility employs only one ager. The interview usually lasted one hour. To ensure consistency of rpretation, the author completed the checklist in each site. The manager's rview was held with the facility manager or acting manager. The interview with facility manager included questions on types of services offered at the facility, ing hours, waiting time, management and support, in-service training and inuing education, workload and staff establishments, service delivery and access, quality assurance (copy of interview schedule can be found in Appendix V). All views were taped and analysed by the author.

ICON project evaluated whether contracts between health authorities and private providers for the ery of primary health care (PHC) to people dependent on publicly funded PHC can be a desirable ative to direct public provision, particularly for under-served communities in South Africa.

The technical quality checklist used in this study included the following categories: 1) infrastructure; 2) access; 3) management and staffing; 4) drugs and diagnostic testing; and, 5) patient environment. Each category was awarded standardised scores according to a standardised list of scores (Rispel et al., 1996) (see scoring tool in Appendix IV). The *infrastructure* category looked at the following indicators: electricity, adequate toilets, functioning refrigerator, emergency kit, drug storage, and cleanliness. In terms of the *access* category, indicators were the size of building for patient load, a range of TB services offered, whether emergency instructions after hours were posted, the facility opening times, availability of TB treatment after hours, position in relation to community served, and availability of transport for TB patients. The *management and staffing* assessed continuing education in DOTS, workload (patient load per full-time equivalent consulting/professional staff), quality assurance at the facility, record keeping systems, and whether active defaulter tracing was in place. The category *drugs and diagnostic testing* assessed the availability of a copy of the National TB Control Programme Practical Guidelines, essential TB drugs, and diagnostic tests in the facility, whether active case finding was in place, and turn-around time for sputum smear test results. Finally, the *patient environment* category included waiting time, adequacy of the waiting area, patient privacy, patients' complaints/suggestions mechanisms, whether health education materials were on display, and where the first sputum specimen is collected (health safety issue).

Methods used for assessing process quality

A detailed interview schedule was used to conduct sixteen semi-structured interviews with health care providers, including doctors (n=6; 1 doctor in each site), nurses (n=6; 1 nurse in each site) and treatment supporters (n=2; 1 treatment supporter in site C and 1 in site D) (see Appendix VI). The main reasons for the chosen sample size (one doctor, one nurse and one treatment supporter per facility) were to cover a range of different service providers (doctors, nurses, and treatment supporters), rather than conduct more interviews with the same provider type. The interviews sought to gather factual information on their knowledge of TB treatment guidelines, in particular, TB diagnostics and procedures, TB treatment methodology, management of side effects of TB treatment, and patient education. These interviews were also used to elicit staff perceptions of the problems with which the facility was faced. The interviews usually lasted between one hour and one and half hours. The information from the health care provider interviews was analysed quantitatively and qualitatively.

Methods used for assessing outcome quality

A total of 120 records of new sputum positive pulmonary TB patients were reviewed in 6 facilities to measure patient adherence to TB treatment and treatment outcome. A sample of records was selected from the TB patient register in each site for all the patients who started the treatment in the period January - June 2001. Every second record was selected and the sample consisted of 25 records in each site. The sample size of 25 records in each site was chosen due to a considerable time it takes to review a single patient record. As this study's focus was on the new pulmonary patient, all the records for re-treatment cases were discarded. The number of records reviewed in each site was as follows: 23 in site A, 21 in Site D and 19 in sites B, C, E and F. For each patient, the following data were recorded: 1) date of diagnosis, 2) patient category and treatment regimen, 3) record and result of sputum test at the end of the intensive phase of the treatment 4) record of whether the treatment was completed, and 5) treatment outcome (see Appendix VII). The records were analysed in the context of the National TB Treatment Guidelines.

6.2.5 Sensitivity analysis

A sensitivity analysis was undertaken to assess the robustness of the results to changes in the weights used for each category in the composite score. A new composite score for the quality of care assessment, where categories that may have more influence on the final quality of care score, such as access and treatment outcomes, were allocated a higher weight, in order to minimize the influence of other components such as patient environment, infrastructure and the provider knowledge on the final score.

6.3 Results

6.3.1 Technical quality

Technical quality performance at each site is shown in Table 6.4. Each category is discussed in detail below.

Table 6.4: Technical quality performance (% of maximum score for each category[a])

Category	Public-private for-profit model		Public-private non-profit model		Pure public model	
	Site A	Site B	Site C	Site D	Site E	Site F
Infrastructure	96%	96%	54%	89%	89%	69%
Access	88%	97%	64%	73%	60%	64%
Management and staffing	77%	77%	70%	70%	29%	29%
Drugs and diagnostic testing	93%	100%	75%	75%	81%	75%
Patient environment	56%	80%	66%	74%	82%	67%

[a] The scoring method is presented in Appendix IV.

Infrastructure category produced varied results, with scores ranging from 54% to 96%. This category aimed to establish essential technical criteria for TB treatment delivery: reliable electricity, functioning refrigerator, sanitation, emergency kit, safe drug storage and cleanliness. Sites A and B achieved a high score for infrastructure, followed by sites D and E. Site C lacked adequate sanitation (less than 3 toilets per 100 patients per day, and no wheelchair access toilet) and several areas of the facility were dirty. As a result, this site achieved a score of 54%. Site F also scored low in this category mainly because an emergency kit on site was incomplete and waiting area in the facility was dirty.

The second category aimed to measure geographical and physical access to TB services, and the range and frequency of TB services offered. Sites C and E were often overcrowded and sites D and F were overcrowded on peak days only. Only sites A and B offered a wide range of TB services on site, treatment, laboratory and radiology investigations, and had emergency instructions after hours clearly visible. TB patients in all other sites had to visit another clinic/day hospital for radiology investigations. Sites E and F did not offer TB treatment after hours and were within 2km for less than 40% of population served. Site B scored very high (97%) because it offered a range of TB services, including transport services for TB patients.

Management and staffing assessed training, workload, quality assurance at the facility, record keeping system and defaulter tracing. This category also produced very varied results, with scores ranging from 29% to 77%. Common problems were the absence of continuing education programmes (all sites), quality assurance mechanism at the facility (sites A, B, E and F) or active defaulter tracing system in place (sites E and F). In addition, sites E and F had a low staff to patient ratio (over 45 patients were seen per day per full-time equivalent staff). These two sites achieved the lowest score (29%). All sites had a good record keeping system, where it was possible to link a TB patient to his/her records.

Site B scored 100% on *drugs and diagnostic testing* category. This category assessed the availability of a copy of the standard TB guidelines, essential TB drugs, diagnostic testing available at the facility, active TB screening and turn around time for sputum smear test result. In comparison with other sites, site C scored low in this category (66%) in reflection of the availability of basic TB drugs. This site was lacking in some basic TB drugs (Rifanah 300) for a week including the main pharmacy in the area. For diagnostic testing component of this category, only sites A and B offered a range of diagnostic testing at the facility.

The *patient environment* category included waiting time, adequacy of the waiting area, patient privacy, patient complaints mechanism in place, whether education materials were on display, and safety (whether the first sputum specimen is collected in a well ventilated area or outside without others watching). Different sites exhibited a range of strengths and weaknesses. The most serious problems were long waiting times (sites E and F in particular), insufficient patient privacy (sites A, C and E), a lack of health education materials available for patients (site A and B), and safety (sites A, C, D and F).

6.3.2 Process quality

This section starts with a brief overview of the characteristics of health care providers in the study sites. It then presents findings on the providers' knowledge of the national TB treatment guidelines, main problems regarding working conditions they experience, and their motivation for the work they are doing.

Characteristics of health care providers

More than half (67%) of the doctors interviewed were women (in sites B, C, D, and E) and the majority (83%) had qualified since 1990 (in all sites but A and D). This suggests that the mean age of the majority of doctors was thirty-five years and younger. Three (43%) had post-graduate training, mostly as diplomas or masters degrees. All the nurses who were interviewed were female and all had a diploma in nursing. The year of graduation ranged from 1988 to 1999, reflecting a wide variety of experience in nursing. All the treatment supporters interviewed had a mean of 6 years of schooling and worked as volunteers in the community. All health care providers were trained on DOTS.

Knowledge of the TB treatment guidelines

This category looked at the health care providers' knowledge of standard TB treatment guidelines and information given to TB patients by health care providers. It included the providers' knowledge of symptoms and signs of TB, the first diagnostic test used for confirmation of pulmonary TB, essential TB drugs and the dosage, side effects, management of side effects, and information given to TB patients. The knowledge by the health care providers was assessed against the national TB treatment guidelines. The percentage of the possible maximum score that the health care providers achieved in this category is shown in Table 6.5 (as % of the maximum score achievable for that facility).

Table 6.5: Process quality performance

Category	Public-private for-profit model		Public-private non-profit model		Purely public model	
	Site A (n=2)	Site B (n=2)	Site C (n=3)	Site D (n=3)	Site E (n=2)	Site F (n=2)
Knowledge of most common symptoms of pulmonary TB	Very good[a]	Very good	Adequate	Adequate	Adequate	Adequate
Knowledge of the first diagnostic test for confirmation of pulmonary TB	Very good	Adequate	Very good	Adequate	Very good	Very good
Knowledge of the essential TB drugs and the dosage	Very good	Very good	Adequate	Adequate	Very good	Very good
Knowledge of side effects of TB treatment	Adequate	Adequate	Adequate	Adequate	Adequate	Adequate
Knowledge of management of side effects of TB treatment	Adequate	Very good	Adequate	Adequate	Adequate	Adequate
Information given to TB patients	Adequate	Adequate	Adequate	Very good	Very good	Adequate
Combined score for the category using the geometric mean	**89%***	**89%**	**83%**	**83%**	**89%**	**86%**

[a] The scoring method is presented in Appendix IV. For example, where all 7 symptoms of TB were mentioned, the site scores 'very good' or 100%. If between 3 and 5 symptoms were mentioned, the site scores 'adequate' or 80%.

The most common symptoms of pulmonary TB are persistent cough for 3 weeks or more; sputum production; shortness of breath, and chest pain; loss of appetite and loss of weight; a general feeling of illness; tiredness and loos of motivation; and night sweats and fever (Department of Health 2000a). All health care providers mentioned persistent cough for 3 weeks or more and night sweats and fever as some of the symptoms of pulmonary TB. Only one health care provider (a nurse in site D) mentioned "a general feeling of illness" as an additional symptom of TB.

According to the national TB treatment guidelines, new patients are diagnosed using 2 sputum microscopy smears and subsequently twice more during treatment to monitor progress. Cultures are not done routinely for new cases and x-rays are not recommended for first-line diagnosis. New TB patients are given standardised short-course drug regimens in the correct combination and dosage 5 days a week for 6 months. The essential drugs for pulmonary TB are isoniazid, rifampicin, pyrazinamide, streptomycin and ethambutol (their dosages and combinations are given in Appendix VI) (Department of Health 2000a). Whilst all the providers in sites E and F knew that the first diagnostic test for confirmation of pulmonary TB is a sputum test, a nurse in site B was incorrect in saying it was a chest x-ray, and a treatment supporter in site D did not know the answer. All the providers except the treatment supporters in sites C and D could list the essential drugs for pulmonary TB and their correct dosage.

The minor side effects of TB treatment are anorexia, nausea, abdominal pain, joint pain, burning sensation in feet, and orange/red urine. The major side effects are skin itching/rash, anaphylactic reaction, deafness, dizziness, jaundice, vomiting and confusion, visual impairment, and generalised reaction, including shock and purpura (Department of Health 2000a). All sites scored 80% for the knowledge of side effects of TB treatment in pulmonary TB. In sites A and B doctors had a very good knowledge but nurses only had poor-to adequate knowledge. In sites C and D, both doctors and nurses had a very good knowledge of side effects but treatment supporters had a very poor knowledge – they either could not remember or mentioned only 2 side effects. In sites E and F, both doctors and nurses had adequate knowledge of side effects.

Whilst all providers gave a correct answer when asked what advice they would give to a TB patient who is on TB treatment and who is complaining of nausea ("give tablets last thing at night") and orange urine ("reassurance"), they failed on what advice they would give if the patient is experiencing visual impairment. Only one doctor in site B said she would stop the treatment immediately.

When asked what information they provide to a patient who is diagnosed with TB, all the providers gave adequate to very good information. In each site, more than two-thirds of the providers provided TB patients with information on method of taking drugs. Fifty percent of providers in sites E and F, and one-third of the providers in sites A, B, C and D, informed TB patients about the disease and adverse effects of the treatment. Whilst 50% of providers in sites A and B and 15% of providers in sites C and D, none of the providers in sites E and F advised TB patients to have a good healthy diet. Similarly, none of the providers in sites E and F advised their patients on the symptoms of TB and family contact tracing. However, whilst none of the providers in sites A, B, C, and D mentioned commitment and responsibility, two-third of the providers in sites E and F said they would advise a TB patient to be committed and responsible to complete the treatment. Overall, providers in sites D and E gave more extensive information to TB patients and achieved a score of 100%.

In summary, all sites achieved a similar score (between 83% and 89%) in *technical* quality of care category. In comparison to other sites, sites C and D scored lower, mainly as a reflection of a poor knowledge of the first diagnostics test for confirmation of pulmonary TB and the essential TB drugs by the treatment supporters. On average, sites A and B achieved the highest score (91%), followed by sites E and F (88%) and sites C and D (83%). This was mainly due to the very poor knowledge of treatment supporters.

6.3.3 Outcome quality

According to the South African TB Control Programme Guidelines, the main treatment outcome indicators are compliance by the patients to the treatment regimen, keeping the treatment interruption rate below 5%, and smear-conversion after the first part of the treatment (intensive phase). A well functioning TB control programme must achieve a smear conversion rate of at least 85% amongst new smear positive cases. In this study, key treatment outcome indictors included:

(a) the successful treatment completion rate (% of patients who are cured plus those who completed treatment but without laboratory proof of cure);

(b) the interruption rate (% of patients whose treatment was interrupted for two months or more);

(c) the sputum conversion rate (% of smear-positive patients who converted to sputum smear-negative after the first phase of the treatment); and,

(d) the cure rate (% of patients who are proven to be cured using smear microscopy at the end of the treatment).

Table 6.6 below shows the findings of the records review at each site. As the findings indicate, patients supervised in the public clinics (sites E and F) generally had lower treatment completion rates, and patients supervised in the occupational health clinics in the workplace (sites A and B) and in the community (sites C and D) achieved highest treatment completion rates. Overall, the proportion of patients successfully completing the minimum of six months' treatment ranged from 74% (site E) to 87% (sites B and D).

Table 6.6: Treatment outcome rates for new pulmonary TB patients

Indicator	Public-private for-profit model		Public-private non-profit model		Purely public model	
	Site A	Site B	Site C	Site D	Site E	Site F
Treatment completion rate	86%	87%	82%	87%	74%	78%
Treatment interruption rate	1%	1%	11%	7%	24%	17%
Sputum conversion rate	82%	80%	67%	81%	73%	68%
Cure rate	83%	81%	65%	87%	64%	78%

The treatment interruption rate in sites C, D, E and F was between 1.5 and 4.8 times higher than the national target rate of 5%. Less than 1% of TB patients in sites A and B interrupted the treatment. It is suspected that this relatively low treatment interruption rate is mainly because of a 'parading'[2] system that is in place in the mining medical facilities.

Percentage of patients who had their sputum collected at the end of the intensive phase of the treatment ranged from 67% (site C) to 82% (site A). Cure rate was between 64% (site E) and 87% (site D). Only site D achieved the national target cure rate of 85%. Table 6.7 below summarises the treatment outcome quality performance for each treatment outcome indicator. It also presents a combined score for this category using the geometric mean. More detailed information on this category is shown in Appendix IV.

Table 6.7: Outcome quality performance (% of maximum score)

Category	Public-private for-profit model		Public-private non-profit model		Purely public model	
	Site A	Site B	Site C	Site D	Site E	Site F
Treatment completion rate	100%[a]	100%	60%	100%	20%	20%
Treatment interruption rate	100%	100%	60%	60%	20%	20%
Sputum conversion rate at the end of the first phase	60%	60%	20%	60%	60%	20%
Cure rate	60%	60%	20%	100%	20%	60%
Combined score for the category using the geometric mean	**80%**	**80%**	**40%**	**80%**	**30%**	**30%**

[a] The scoring method is presented in Appendix IV. For example, if less than 70% of patients completed treatment, the site scores 10%, and if more that 84% of patients completed treatment, it scores 100% (as one of the aims of the NTCP is to have 85% completion treatment rate).

In the treatment outcome category, sites A, B and D achieved 80%. In these three sites, over 84% of TB patients completed their TB treatment. In sites A and B less than 1% of patients interrupted treatment, and in site D over 84% of patients were cured at the end of the treatment. The scores in the other three sites ranged from 30% to 40% reflecting differences in treatment completion, interruption and cure rates.

6.3.4 Development of a composite score for the quality of care assessment

In order to quantify the quality of care assessment at each site, a composite scoring method was developed by drawing selected criteria from different components of the quality of care assessment and grouping them into categories (see Table 6.8). For example, the infrastructure category included criteria concerning electricity, drug storage and toilets. Each criterion was scored out of ten and these scores were combined to produce the total score for that category, also out of ten. The method used to combine the individual criteria scores into a final score for the category was the geometric mean. By using the geometric mean rather than the arithmetic mean the

[2] If a patient does not take his daily TB drugs, he is not allowed to work, and therefore not allowed to earn his wage, until he continues with the treatment. The patient has to report to the clinic where he is formally counselled, and in some cases, if this is repeated, fired.

final score is not influenced by either very high or very low individual scores. In addition, it reflects the compounding effect of quality shortfalls and allows the definition of essential criteria, whose absence would produce a very low overall score (Beattie et al., 1995; Rispel at al., 1996).

Table 6.8: Categories and their respective criteria used in the composite score

Category	Description	Weight
Infrastructure	Establishes minimum technical requirements such as electricity, sanitation, cleanliness.	10%
Access	Geographical access, physical access for the disabled, facility size and opening times, and the range of TB services offered.	12.5%
Management and staffing	Continuing education, patient load per full time equivalent professional/consulting staff, record systems, quality assurance, active defaulter tracing.	15%
Drugs and diagnostic testing	Availability of the standard TB treatment guidelines, essential TB drugs, diagnostic testing, turn around time for sputum smear results.	10%
Patient environment	Wide range of issues related to patient care including waiting time, waiting area, patient privacy, health education materials, patient complaints/suggestions.	10%
Technical quality of care	Knowledge of symptoms of pulmonary TB, diagnostic criteria and procedures, treatment methodology, management of side effects, patient education.	17.5%
Treatment	Quantifies the review of clinical treatment of TB, in particular adherence to TB treatment, and treatment outcome.	25%

To determine the individual score for each criterion, several levels of achievements were defined. For example, within the "patient environment" category, there was a criterion on total patient time spent at the facility. The levels of achievement were defined as minutes spent at the facility, with <30 minutes scoring ten and >60 minutes scoring three. There were two other possible levels of achievement in this criterion which scored five and eight respectively.

The best score is ten out of ten, and the poorest anything from 0.1 to 9 out of ten, depending how important the criterion was judged to be for overall quality. The lower the poorest score, the more critical the absence of that criterion was considered for overall quality. For example, the total absence of a reliable electricity power supply got a score of 0.1, while the absence of after-hours instructions/contact received a score of eight. The value of the poorest score therefore became the mechanism of weighting the criteria relative to each other, within the category.

The criteria were grouped into seven categories and each category was weighted in the final analysis, as shown in Table 6.8 above. The combination of categories was weighted using arithmetic mean. Categories and their respective criteria used in the composite score, and the weights for each category, were adapted from the study by Rispel et al (1996).

The composite score combined different categories in order to quantify the quality of care. The criteria were grouped into seven categories. The results of the seven categories at each site are shown in table 6.9, followed by discussion of the findings. The complete set of criteria and scores achieved at each site are shown in the Appendix IV.

Table 6.9: Summary of scores achieved in each of the seven categories at the study sites

Category	Public-private for-profit model		Public-private non-profit model		Pure public model	
	Site A	Site B	Site C	Site D	Site E	Site F
Infrastructure	96%	96%	54%	89%	89%	69%
Access	88%	97%	64%	73%	60%	64%
Management and staffing	77%	77%	70%	70%	29%	29%
Drugs and diagnostic testing	93%	100%	75%	75%	81%	75%
Patient environment	56%	80%	66%	74%	82%	67%
Technical quality of care	89%	89%	83%	83%	89%	86%
Treatment outcome	80%	80%	40%	80%	30%	30%

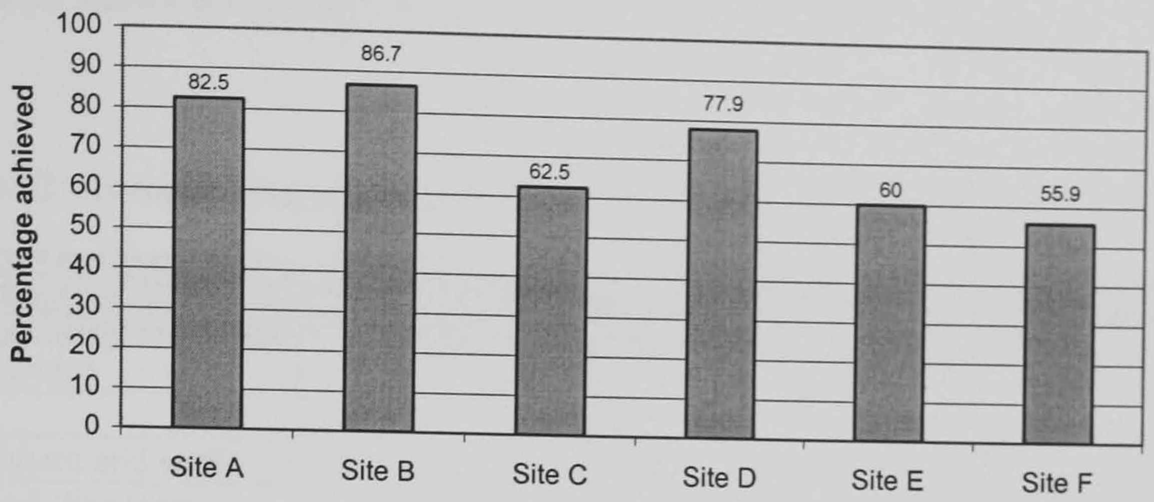
These seven categories were weighted in the final analysis as shown in Table 6.10. The combination of categories was by weighted arithmetic mean.

Table 6.10: Weighted composite scores for each category at study sites

Category	Weight	Public-private for-profit model		Public-private non-profit model		Pure public model	
		Site A	**Site B**	**Site C**	**Site D**	**Site E**	**Site F**
Infrastructure	10%	9.6%	9.6%	5.4%	8.9%	8.9%	6.9%
Access	12.5%	11.0%	12.1%	8.0%	9.1%	7.5%	8.0%
Management and staffing	15%	11.5%	11.5%	10.5%	10.5%	4.3%	4.3%
Drugs and diagnostic testing	10%	9.3%	10.0%	7.5%	7.5%	8.1%	7.5%
Patient environment	10%	5.6%	8.0%	6.6%	7.4%	8.2%	6.7%
Technical quality of care	17.5%	15.5%	15.5%	14.5%	14.5%	15.5%	15.0%
Treatment outcome	25%	20.0%	20.0%	10.0%	20.0%	7.5%	7.5%
Total	**100%**	**82.5%**	**86.7%**	**62.5%**	**77.9%**	**60.0%**	**55.9%**

Figure 6.1 shows the overall weighted total composite score for each site. Sites F and E achieved the lowest overall weighted total at 55.9% and 60.0% respectively, reflecting heavy workloads, poor access and poor treatment outcome. Sites B and A achieved a weighted total score of 86.7% and 82.5% respectively, reflecting a good technical, process and outcome quality of care. Site C and D scored somewhere in between, 62.5% and 77.9% respectively.

Figure 6.1: Total quality of care scores at each site



6.3.5 Sensitivity analysis

The results were robust in sensitivity analysis (see Table 6.11). With alternative assumptions regarding the weights used for each category (a composite scoring method where more TB related categories were allocated a higher weight) sites A and B still had the highest total composite score and, therefore, conclusions remain the same.

Table 6.11: Sensitivity analysis results

Category	Weight	Public-private for-profit model		Public-private non-profit model		Pure public model	
		Site A	Site B	Site C	Site D	Site E	Site F
Infrastructure	5%	4.8%	4.8%	2.7%	4.4%	4.4%	3.4%
Access	20%	17.6%	19.4%	12.8%	14.6%	12.0%	12.8%
Management and staffing	10%	7.7%	7.7%	7.0%	7.0%	2.9%	2.9%
Drugs and diagnostic testing	10%	9.3%	10.0%	7.5%	7.5%	8.1%	7.5%
Patient environment	5%	2.8%	4.0%	3.3%	3.7%	4.1%	3.3%
Technical quality of care	15%	13.3%	13.3%	12.4%	12.4%	13.3%	12.9%
Treatment outcome	35%	28.0%	28.0%	14.0%	28.0%	10.5%	10.5%
Total	**100%**	**83.5%**	**87.2%**	**59.7%**	**77.6%**	**55.3%**	**53.3%**

6.3.6 Quality of care of different models of delivery

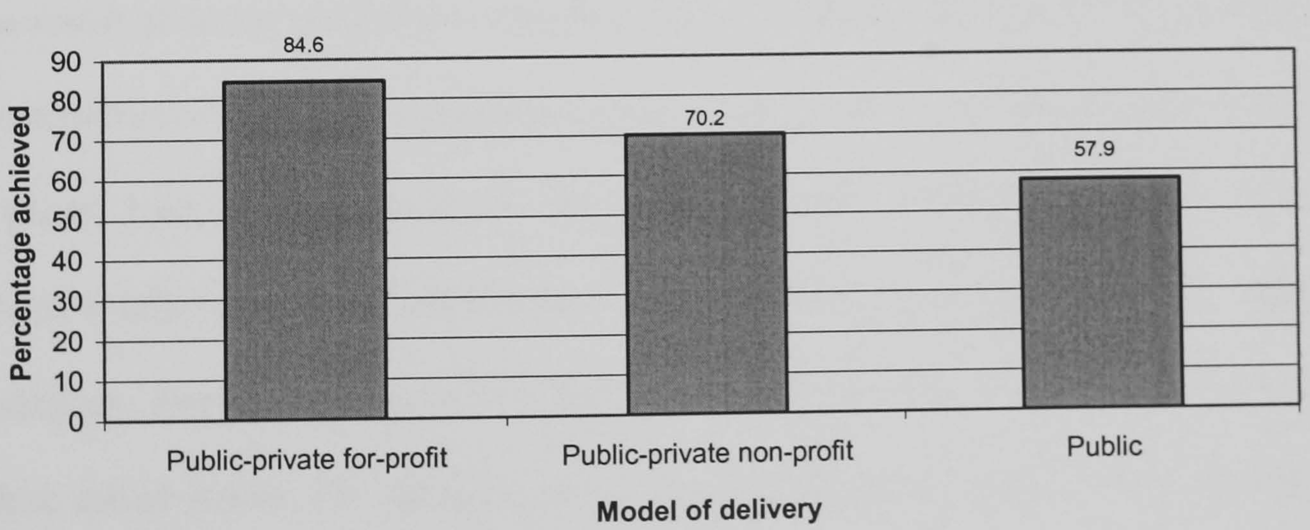
Table 6.12 shows the average weighted scores for each model of delivery.

Table 6.12: Average weighted composite scores for each model of delivery

Category	Public-private for-profit model	Public-private non-profit model	Purely public model
Infrastructure	9.6%	7.1%	7.9%
Access	11.5%	8.5%	7.7%
Management and staffing	11.5%	10.5%	4.3%
Drugs and diagnostic testing	9.6%	7.5%	7.8%
Patient environment	6.8%	7.0%	7.4%
Technical quality of care	15.5%	14.5%	15.2%
Treatment outcome	20.0%	15.0%	7.5%
Total	**84.6%**	**70.2%**	**57.9%**

The figure 6.2 below summarises the total average technical, process and outcome quality of care represented as a total average score for each model of delivery. The findings are discussed in more detail below.

Figure 6.2: Total average quality of care score for each model of delivery



Public-private for-profit model of delivery of TB treatment

In terms of technical quality, the public-private for-profit model of delivery of TB treatment scored higher than the public sector model of delivery in all categories except "patient environment". A lack of health education material on display or available to take home as well as a clear system for patient complaints/suggestions mechanism contributed to a slightly lower score in the category. In terms of process quality, the public-private for-profit and public models of delivery achieved almost the same score, reflecting a very good knowledge of the treatment guidelines for both private and public sector health care providers. As far as the outcome quality of care is concerned, the public-private for profit model scored much higher (20%) for this category compared with much poorer treatment outcomes in the purely public sector (7.5%).

Public-private non-profit model of delivery of TB treatment

The public-private non-profit model of delivery of TB treatment scored higher than the purely public model in three out of seven categories of the quality of care assessment. First, accessibility was better because of the availability of TB treatment after hours. Second, management and staffing category achieved a high score of 10% as a result of lower patient load per full-time equivalent consulting/professional staff, the existence of a quality assurance system at the facility, and active defaulter tracing in place. Last, all four treatment outcome indicators were better, partly reflecting patient's adherence to treatment and partly provider's adherence to the treatment guidelines. For the remaining four categories, scores were very close to those of the public sector model. For instance, in terms of process quality, the public-private non-profit model scored 14.5% compared to 15.2% achieved in the public sector model. On average for all seven categories, and compared to the pure public sector model, the public-private non-profit model showed better technical, process and outcome quality of care.

Purely public model of delivery of TB treatment

An important finding of the composite scores was the indistinct relationship between the resources available and the quality of the clinical treatment provided. The poor quality of treatment in the purely public sector clinics could be connected to the lack of resources. Under-resourced clinics and poor management of the available resources in the purely public sector model of delivery was reflected in the low treatment outcome indicators. For instance, a lack of logistics support such as transport facilities for TB patients or defaulter tracing in the public clinics could have influenced patient's compliance with treatment. The possibility of under-resourced clinics could be the reason for the poor public system.

6.4 Conclusion

This chapter has presented the findings of the performance evaluation, in terms of quality of care, of different models of public-private partnerships in delivery of TB treatment. It has also described differences in quality of care between these models and a pure public model of TB treatment. Data presented suggest that the quality of care is superior in both models of public-private partnerships for TB treatment when compared to the purely public sector model of delivery of TB treatment.

Although differences in quality of care between the models can be identified, their cause is a more complex issue. The mining companies provide TB treatment to their employees within a very well resourced private health system in which the employees have a strong economic rationale to complete the treatment due to the 'parading' system in place. The NGOs, on the other hand, have a strong ideology of care and support. They develop alternative strategies for community-based TB treatment and make the treatment accessible to poorer community members. Finally, the relatively poor quality of TB treatment in the purely public model of delivery could be directly linked to insufficient funding, poor working conditions for doctors and nurses, and the flight of skills to the private sector or overseas.

Essentially, it is the responsibility of the government to provide TB treatment to all South African citizens. However, the models of delivery evaluated here have had an active role in the management of TB due to a combination of history, legislation, necessity and verbal agreement. The legislation has placed the onus of improved medical surveillance of all workers on the employer and has resulted in better equipped resources and mine occupational health facilities. Providers like the mining companies in this study have the institutional capacity to be involved in TB treatment. The community-based DOT programmes run by NGOs have the potential to improve accessibility to TB treatment and provide a TB patient with an alternative treatment supervision option.

The capacity of the public sector to provide subsidies and supply drugs might be enough for the public-private partnerships to deliver high quality of care to TB patients. It is important, however, that the government maintains control by making sure that all providers of TB treatment follow the national TB treatment guidelines. In that way the government keeps control of quality of care and gets data on all patients under treatment.

The findings in this chapter show that, in light of the TB/HIV epidemic, increased collaboration with private providers through partnerships could potentially improve the quality of care. The next chapter will evaluate performance of the partnerships in terms of cost-effectiveness of TB treatment provision and the nature of the factors potentially impacting on cost-effectiveness.

Chapter 7

FINANCING AND COST-EFFECTIVENESS OF TUBERCULOSIS TREATMENT

7.1 Introduction

Chapter 6 has presented the methods and findings of the quality evaluation of different models of public-private partnerships for the provision of TB treatment. It has described differences in quality of care between these models and a purely public provision of TB treatment. The findings suggest that the quality of care is superior in both public-private partnership models of delivery of TB treatment when compared to the purely public sector, and therefore show that, in light of the TB/HIV epidemic, increased collaboration with private providers through partnerships could potentially improve the quality of care and increase access to care.

This chapter looks at cost and cost-effectiveness of different PPP arrangements in the provision of TB treatment, and the financing required for the different models from the perspective of the provincial TB programme, provider, and the patient. The main research questions that will be posed for each model of service delivery are:

1. In terms of cost-effectiveness, how well do these models work?
    a. What is the cost of TB treatment for each model?
    b. What is the effectiveness of TB treatment for each model?
    c. Who is providing resources?
2. How do these models compare to the public sector providers of TB treatment?

3. What is the role of public sector financing in each of the models?

This chapter starts with the methods used for assessing cost and cost-effectiveness of TB treatment for different models of delivery. Findings on financial and economic costs and costs-effectiveness are then presented, followed by sensitivity analyses results. Finally, the role of the public sector financing in each of the models, are discussed.

7.2 Methods

Methods for assessing cost-effectiveness in this study draw mainly on the methods from a number of cost-effectiveness studies performed as a part of the 'Community TB Care in Africa' project (Floyd et al., 2003; Moalosi et al., 2003; Nganda et al., 2003; Okello et al., 2003; Sinanovic et al., 2003).

7.2.1 Models of provision

Three different models of DOT provision were evaluated for a 12-month cohort of newly registered smear-positive patients: purely public, public-for-profit partnership, and public-non-profit partnership (described in detail in chapter 6). In the public model, patients are diagnosed and treated in public clinics, with direct observation undertaken by health workers following national treatment guidelines. These require that new cases are diagnosed using 2 sputum microscopy smears and subsequently twice more during treatment to monitor progress, and are given standardised short-course drug regimens in the correct combination and dosage 5 days a week for 6 months (Department of Health 2000). Cultures are not done routinely for new cases and x-rays are not recommended for first-line diagnosis. There is no mandatory hospitalisation. The public-private for-profit model represents a partnership between Provincial TB Programmes and mining companies where the employer's occupational health services are either reimbursed per TB patient day or receive free TB treatment drugs. Patients are diagnosed and treated in employer-funded occupational health clinics. Employer based private providers were selected as they are a significant source of health care in South Africa. Specifically, mining companies were selected, as there is a long history of TB treatment in the industry. TB incidence is up to 10 times higher in the mines relative to the general population, due both to occupational TB hazards and very high HIV prevalence rates among mine workers. The public-private non-profit model is a partnership between Provincial TB Programmes and NGOs providing community-based DOT in which these NGOs are paid a monthly sum per patient to manage community-based TB programmes. In this model, patients are diagnosed and monitored in public clinics for the first 10 days. Subsequent treatment is directly observed by community health worker 'treatment supporters' in the community. In return for payments from Provincial TB Programmes both of these different private partners are required to follow national treatment guidelines, complete and submit standardised quarterly reports to district TB coordinators, and liaise with district public health facilities.

For each type of provision model, 2 sites were selected. The study sites were two occupational health clinics in two mining companies (site A in North West and site B in the Free State), two clinics working closely with two NGOs in the Western Cape (sites C and D), and two purely public clinics in the Western Cape (sites E and F). The study sites were described in more detail in Chapter 6 (see Table 6.2).

7.2.2 Costing

The aim of the cost analysis was to generate comparable costs of TB treatment between different models of delivery. The specific objective was to estimate the annual full cost of providing TB treatment in the study sites which includes the costs of all resources that were employed in providing TB treatment, including basic infrastructure. The cost analysis was retrospectively undertaken from a provider perspective (the costs of providing TB treatment borne by the organisation delivering the services and the Provincial TB Programmes) and a societal perspective (including patient's travel and time cost). Costs were collected for a 12-month period in each facility between 2000 and 2001 and prices were inflated to 2001 using the medical consumer price index of 8.9% for 2000 (Statistics South Africa 2004). Data were converted to US dollars using the 2001 average annual exchange rate of US$1=Rand 8.57. Average, rather than marginal, economic costs were assessed, which are more relevant for national policy (Murray et al., 2000). New smear-positive pulmonary TB cases were selected because the South African DOTS strategy focuses primarily on improving the cure rate among new patients. Past efforts by the Provincial TB Programmes have shown that if these services improve, the standard of the whole Programme is lifted and cure rates for other categories of TB patients also improve (Department of Health 2001). Although HIV-positive patients have an increased risk of smear-negative and extra-pulmonary TB, the majority of them develop smear-positive pulmonary TB (Department of Health 2001). Finally, National as well as Provincial TB Programmes routinely report on smear-positive pulmonary TB cases and data on other types of TB is not easily available.

An ingredients-based costing methodology was used where quantities of resources were multiplied by their respective prices to obtain total costs (see Table 7.1). Recurrent costs consisted of personnel (clinical, administration, and support), supplies (sputum and culture tests, x-rays, drugs), vehicle and building operating costs. Capital costs included building, equipment, vehicles and training of 'treatment supporters.' They were annualised using 2001 replacement prices; life expectancies of buildings were 30 years, equipment 10 years, vehicles and training 5 years, and the standard discount rate of 3% (Russell et al., 1996). Sputum and culture, x-ray, drugs, and hospitalisation costs were based on actual prices quoted by the providers. Average cost 'treatment supporter' visits was based on the NGO payment per visit. The average cost of a clinic visit and overall organisation and supervision of community-based treatment were established also using the ingredients-based approach. Joint clinic costs were allocated to TB treatment on the basis of the proportion of total clinic visits for which TB patients accounted, and to different types of visits (initial diagnosis and monitoring, and observation) on the basis of interviews with staff and numbers of each type of visit made. Observation was used to determine clinic staff time spent on each type of visit. The average cost of managing a new smear-positive patient from diagnosis to completion of treatment for each site was calculated by multiplying the average cost of each treatment component by the number of times the cost was incurred according to the site-specific clinic protocols. Sources of data for the costing analysis included provider and Provincial TB Programme expenditure reports, National Laboratory Service, private laboratories, local equipment suppliers, vehicle log-books, car dealers, private and provincial pharmacy price lists, interviews with clinic managers, x-ray department record books, and observation.

Table 7.1: Methods used for measuring, identifying and valuing the costs of TB treatment

TYPE OF COST	IDENTIFICATION	MEASUREMENT		VALUATION	
	Categories	Costing method	Sources of data	Valuation method	Sources of data
Recurrent					
Personnel	Administration and management, clinical staff (doctors, nurses, lay workers), and support staff (cleaning)	Percentage of time spent on different activities	Observation and semi-structured interviews with providers	Total remuneration package costs	Provider expenditure reports
Supplies	Sputum and culture tests, x-rays and drugs	Quantity consumed	Patient records	Market prices	Provincial and private laboratories and pharmacy price lists
Vehicle operating and maintenance	Vehicle running costs	Number of kilometres travelled	Vehicle logbook, interview with clinic manager	Actual expenditure on fuel, oil and maintenance	Automobile Association rates (R0.86 per km)
Building operating and maintenance	Overheads (water, electricity, telephone, fax, stationeries etc)	Proportion of total visits for which TB patients accounted	Actual costs from facility records, interview with clinic manager	Actual expenditure	Provider expenditure reports
Capital					
Buildings	Offices, clinics and hospitals	Proportion of total visits for which TB patients accounted	Interview with clinic manager	Replacement prices	CSIR Building and Construction Technology
Equipment	Furniture, medical and non-medical equipment	Proportion of total visits for which TB patients accounted)	Interview with the clinic manager	Replacement prices	Local manufacturers
Vehicles	Vehicles used for TB patients	Vehicle utilisation (km travelled)	Vehicle log book, interview with clinic manager	Replacement prices	Local car dealers
Training	Community "treatment supporters" training	Number of treatment supporters trained	Actual costs from NGO records	Actual expenditure	Interview with NGO manager

Patient costs were estimated using a retrospective structured patient interview (see Appendix VIII). A random sample of 20 patients in each site was asked about travel and time costs associated with clinic visits for diagnosis and treatment monitoring, and visits to clinics or 'treatment supporters' for DOT. Time costs were converted to a monetary value based on the average income reported by the patients interviewed (Russell et al., 1996). Diagnosis and treatment of TB are free of charge to patients.

Financial and economic costs

Costs were collected retrospectively to consider both the financial and economic costs. Financial costs represent actual expenditure on goods and services purchased. Economic or opportunity costs include the estimated value of goods or services for which there were no financial transactions or when the price of the goods did not reflect the cost of using them productively elsewhere.

> *"The basic idea is that things have a value that might not be fully captured in their price. It is not difficult in many health programmes to identify resource inputs for which little or no money is paid: volunteers working without payment; health messages broadcast without charge; vaccines or other supplies donated or provided at a large discount by organisations or individuals"* (Creese and Parker, 1994).

Financial and economic costs mainly differ in the way they treat (Creese and Parker, 1994):

- donated goods and services (economic costs include the estimated value of donated goods or services);
- other inputs whose prices are incorrect or distorted (economic costs capture the cost of goods when the price does not reflect the cost of using them productively elsewhere); and,

- valuation of capital items (economic costs also allow for people's preferences for receiving goods and services now rather than later).

In this study, economic costs included subsidies provided by the provincial TB Control Programmes (i.e. drugs and reimbursement) to the private providers, opportunity cost of treatment supporter's time (R300 per patient treated, based on the average wage in the study area), and annuitised capital costs.

In this study, economic costs are used because they are important when considering issues related to the sustainability or expansion of projects, as well as being a component of cost-effectiveness decision-making where choices are made regarding the allocation of scarce resources (Walker and Kumaranayake, 2002). Financial costs, on the other hand, are used when the purpose of the costing exercise is to compare expenditure against budget allocations or to explore affordability of the project (Kumaranayake et al., 2000b). In this instance, the financial cost of a consumed resource for which nothing was paid (for example, a subsidy) is zero. Since one of the study aims was to estimate the financing required for the different models from the perspective of the provincial TB programme, provider, and the patient, financial costs were also used as they can indicate who is paying for different types of costs. Economic costs were estimated through discussions with the providers and through observation at the study sites of the resources used in the provision of TB treatment.

7.2.3 Effectiveness and cost-effectiveness

To calculate the effectiveness measures, the cohort of all new smear-positive pulmonary patients who started treatment during the 12-month costing period was followed to obtain the treatment outcomes. First, the cure rate was estimated as the percentage of cases cured (as confirmed by smear microscopy at the end of treatment). The cure rate for new smear-positive patients is regarded as the key indicator in high burden countries (World Health Organisation, 2002). South Africa is aiming to achieve the accepted WHO target of an 85% cure rate for new smear-positive cases. Second, the percentage of cases successfully completing treatment was used, as not everyone completing also had final laboratory testing to see if cured. For both measures of effectiveness the transferred out cases were excluded from the denominator[1]. The main source of effectiveness data was TB registers (routinely reported information regarding treatment outcomes).

The cost-effectiveness ratio was calculated for each model of provision by dividing cost by the unit of effect and compared with each other. As these partnership models use resources from a number of sources (provider, patient and government), both a provider and societal perspective is adopted for the cost-effectiveness analysis.

[1] In order to be in line with international and national reporting requirements, TB patients who were transferred out (i.e. patients who have been transferred to another reporting district and for whom the treatment outcome is not known) will in future be included in the denominator of the reporting district where they were initially registered. This may initially impact negatively on the cure rate but should eventually contribute to better control of the epidemic.

7.2.4 Sensitivity analyses

To reflect the uncertainty inherent in the analysis, four univariate sensitivity analyses were performed: using alternative assumptions regarding provider costs (reduction of 50% of value of staff time in baseline analysis); using alternative assumptions regarding patient costs (limits of 95% confidence interval); variation in discount rates (3% below and above the rate used in baseline analysis); and adjusting effectiveness data by the death rate. The latter was to explore how important differential HIV prevalence across sites may be. Effectiveness was re-calculated by adjusting the total number of patients in the cohort by the total number of deaths in the same cohort. Different assumptions about provider and patient costs were examined because they constituted the major costs.

7.3 Results

This section summarises findings on the financial and economic costs and cost-effectiveness of TB treatment for new smear-positive pulmonary TB patients. Total provider costs are first presented, followed by average provider costs, average patient costs, effectiveness and cost-effectiveness. The findings are disaggregated to the cost to providers, provincial TB Control Programmes and patients. Finally, results of the sensitivity analyses are discussed.

7.3.1 Total provider costs

Total provider costs of TB treatment are presented in Table 7.2. The economic cost analysis shown here included government subsidies to private providers (discussed in detail in section 7.4.1), opportunity cost of "treatment supporters" time and annualised capital costs. The financial cost analysis, on the other hand, excluded subsidies to private providers, used the actual payment by the NGO to treatment supporters, and depreciated capital costs using a straight-line depreciation. Overall, there is a wide range of total provider costs among the sites.

As mentioned earlier in the chapter, the public-private for-profit model represents a partnership between Provincial TB Programmes and mining companies where the employer's occupational health services are either reimbursed per TB patient day (site B) or receive free TB treatment drugs (site A). This had a major impact on the cost of supplies in site B that had to pay the private sector market price for TB treatment drugs. The reimbursement per patient day that this site received from the provincial TB control programme covered a small fraction of the expenditure on drugs. The cost of drugs in site A were estimated using the government tender prices because the provincial TB Control programme provided this site with free drugs. Therefore, the cost of supplies was considerably lower in site A when compared to site B. The different types of reimbursement allow pair-wise comparisons between different sites in the same model of provision (site A versus site B). More detailed explanation of the subsidies to the private providers is provided later in this chapter (section 7.4 on the public sector financing).

Table 7.2: Total provider costs of TB treatment for each site in 2001 Rand[a]

Cost category	Public-private for-profit model				Public-private non-profit model				Purely public model			
	Site A		Site B		Site C		Site D		Site E		Site F	
	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic
Recurrent												
Personnel	314,072	314,073	658,200	658,200	272,934	358,134	53,649	67,899	221,376	221,376	601,256	601,256
Supplies[b]	32,566	69,730	1,410,536	1,542,512	189,463	189,463	26,685	26,685	45,364	45,364	92,864	92,864
Vehicle operating and maintenance	48,523	48,523	39,603	39,603	28,321	28,321	7,215	7,216	13,092	13,092	17,266	17,266
Building operating and maintenance	59,553	59,553	76,224	76,224	36,221	36,221	4,995	4,995	28,080	28,080	25,411	25,411
Total recurrent costs	*454,715*	*491,879*	*2,184,563*	*2,316,539*	*526,940*	*612,140*	*92,545*	*106,795*	*307,912*	*307,912*	*736,797*	*736,797*
Capital												
Buildings	36,453	76,552	77,302	162,335	21,481	38,666	4,756	8,561	10,697	19,256	18,267	32,880
Equipment	14,291	30,012	22,638	47,541	7,883	14,190	1,783	3,210	3,792	6,825	7,446	13,402
Vehicles	19,519	40,992	15,084	31,677	11,130	20,034	2,621	4,718	5,401	9,721	6,113	11,004
Training of lay workers	N.A.	N.A.	N.A.	N.A.	1,716	3,088	1,241	2,435	N.A.	N.A.	N.A.	N.A.
Total capital costs	*70,264*	*147,556*	*115,025*	*241,553*	*42,211*	*75,979*	*10,402*	*18,925*	*19,891*	*35,802*	*31,826*	*57,287*
Total costs	*524,980*	*639,435*	*2,299,589*	*2,558,092*	*569,151*	*688,118*	*102,948*	*125,720*	*327,803*	*343,714*	*768,623*	*794,084*

[a] Cost data from 2001. US$ 1= R8.57 (2001); N.A. = not applicable.

[b] Provincial TB Programme covered the cost of drugs in all the sites except in site B where a reimbursement on a patient day basis was provided. In addition to the drugs, the Programme also covered the cost of diagnostic tests in sites C-F;

Compared to the financial costs, the economic costs of supplies in site A are almost double the financial costs as a result of the government subsidy (free drugs) to the private provider. The government subsidy to the NGOs providing TB treatment in sites C and D as well as the opportunity cost of "treatment supporters" time has increased the cost of personnel in these two sites. Overall, across all the sites, the capital costs have increased as a result of different approach to the costing of capital items.

Results in Table 7.3 below indicate that, although there was significant variation across sites, personnel and medical supplies (i.e. drugs and diagnostic tests) captured the highest proportion of total costs in all the sites. The high supply costs in site B (61%) are attributable to the cost of drugs in the private market. The low costs of supplies in site A are the result of free drugs provided by the Provincial TB Control Programme. As mentioned earlier, financial costs represent actual expenditure on goods and services purchased, and therefore the cost of donated goods is zero. This site has the highest capital costs (14%) and the building and vehicle operating costs (11% and 9% respectively) which implies the capital-intensive nature of service provision (e.g. patients are admitted to the hospital for the first week of treatment). The relatively high personnel costs in sites E and F (67% and 78% respectively) are attributable to the labour-intensive nature of service provision, salary levels of staff employed by the relevant local authority, and the type of personnel (professional nurses) who observe the treatment.

Table 7.3: Percentage of total provider costs of TB treatment for each site

Cost category	Public-private for-profit model				Public-private non-profit model				Purely public model			
	Site A		Site B		Site C		Site D		Site E		Site F	
	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic
Recurrent												
Personnel	*60*	*49*	*29*	*27*	*48*	*52*	*52*	*54*	*67*	*64*	*78*	*76*
Supplies	*6*	*11*	*61*	*60*	*33*	*27*	*26*	*21*	*14*	*13*	*12*	*12*
Vehicle operating and maintenance	*9*	*7*	*2*	*1*	*5*	*4*	*7*	*6*	*4*	*4*	*2*	*2*
Building operating and maintenance	*11*	*9*	*3*	*3*	*6*	*5*	*5*	*4*	*9*	*8*	*4*	*3*
Total recurrent costs	*86*	*77*	*95*	*91*	*92*	*89*	*90*	*85*	*94*	*90*	*96*	*93*
Capital												
Buildings	*7*	*6*	*3*	*6*	*4*	*6*	*5*	*7*	*3*	*6*	*2*	*4*
Equipment	*3*	*2*	*1*	*2*	*1*	*2*	*2*	*2*	*1*	*2*	*1*	*2*
Vehicles	*4*	*1*	*1*	*1*	*2*	*3*	*2*	*4*	*2*	*3*	*1*	*1*
Training of lay workers	*N.A.*	*N.A.*	*N.A.*	*N.A.*	*1*	*1*	*1*	*2*	*N.A.*	*N.A.*	*N.A.*	*N.A.*
Total capital costs	*14*	*23*	*5*		*8*	*11*	*10*	*15*	*6*	*10*	*4*	*7*
Total costs	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*

N.A. = not applicable

7.3.2 Average provider cost per patient treated

The cost per TB patient treated varied across the models of treatment provision (Table 7.4), with the highest costs for the public-private for-profit model (R4,660–R6,379) reflecting different protocols related to hospitalisation (Site A) and procurement of drugs. In Site B, the only site without public financing of drugs, 52% of the entire treatment cost was drugs. The public-private non-profit model had the lowest cost per patient treated and was less than half of that found in the public-private for-profit model. DOT was the most significant cost in public clinics (84-85%) and 40-51% of costs in the public-private for-profit sites. The largest cost component for the public-private non-profit was the overall supervision of the programme (28-29%). The average cost of a health clinic for initial diagnosis and monitoring during treatment (excluding drugs and investigations) was higher than the average cost of a health clinic visit for observation of treatment due to a longer time it takes for diagnosis and monitoring during treatment.

The average financial cost of a health clinic visit for monitoring ranged between R46 (site B) and R56 (site F) mainly reflecting the cost of staff time spent on TB patients and clinic overheads. The cost of a visit to "treatment supporter" was higher in site D than is site C because the NGO involved in the community TB programme in site D paid its treatment supporters a higher incentive. Compared to the cost of a clinic visit for DOT, the cost of a treatment supporter visit was eight times lower in site C and seven times lower in site D. Although both site A and site B used a private laboratory for sputum smear tests, the cost was lower in site B than in site A. This cost was slightly lower in all other study sites than the National Laboratory Service used by the other sites.

Average economic cost of a health clinic visit for monitoring ranged between R53 (site B) and R69 (site D), 10% higher than the financial cost reflecting the way in which capital items were costed. The economic cost of a visit to "treatment supporter" was higher than the financial cost but equal in sites C and D, as it was assumed that the opportunity cost of "treatment supporter's" time was the same in these two sites and (R300 per patient). The highest economic cost in site C and D was the cost of overall supervision for community-based programmes. This cost was between 19% and 23% higher than the financial cost due to the government subsidy to the NGOs involved in TB treatment provision.

The South African TB Control Treatment Guidelines and directly-observed treatment system in place in each study site were described in detail in Chapter 6. Process indicators for different components of TB treatment (i.e. details on the expected number of visits and diagnostic tests) and average costs for each type of visit and diagnostic test for a new smear positive pulmonary TB patient, are given in Appendix VIII.

Table 7.4: Average provider costs of managing a new smear-positive patient from diagnosis to completion of treatment, 2001 Rand (% of total)[a]

Cost category	Public-private for-profit model				Public-private non-profit model				Purely public model			
	Site A		Site B		Site C		Site D		Site E		Site F	
	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic
Hospital stay[b]	1,715 (37%)	1,886 (34%)	N.A.	N.A.	N.A.	N.A.	N.A	N.A.	N.A.	N.A.	N.A.	N.A.
Health clinic visits for monitoring[b]	105 (2%)	121 (2%)	139 (2%)	158 (3%)	150 (9%)	195 (9%)	158 (9%)	206 (9%)	151 (4%)	160 (4%)	167 (3%)	173 (3%)
Health clinic visits for DOT[b]	2,497 (54%)	2,866 (51%)	2,262 (39%)	2,574 (40%)	238 (14%)	309 (14%)	241 (13%)	335 (15%)	3,458 (83%)	3,653 (84%)	4,017 (85%)	4,160 (85%)
Visits to "treatment supporters" for DOT[b]	N.A.	N.A.	N.A.	N.A.	336 (19%)	468 (22%)	384 (21%)	468 (22%)	N.A.	N.A.	N.A.	N.A.
Sputum smears[c]	100 (2%)	100 (2%)	122 (2%)	122 (2%)	142 (8%)	142 (7%)	142 (8%)	142 (6%)	142 (3%)	142 (3%)	142 (3%)	142 (3%)
Sputum culture[c]	142 (3%)	142 (3%)	148 (3%)	148 (3%)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	391 (8%)	N.A.
Drugs[c]	N.A.	391 (7%)	2,970 (52%)	3,282 (52%)	391 (22%)	391 (18%)	391 (22%)	391 (18%)	391 (9%)	391 (9%)	N.A.	391 (8%)
X-rays[c]	101 (2%)	101 (2%)	94 (2%)	94 (2%)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Supervision of community-based programme	N.A.	N.A.	N.A.	N.A.	488 (28%)	635 (29%)	488 (27%)	614 (28%)	N.A.	N.A.	N.A.	N.A.
Training for" treatment supporters"	N.A.	N.A.	N.A.	N.A.	9 (0.5%)	11 (1%)	9 (0.5%)	11 (1%)	N.A.	N.A.	N.A.	N.A.
Total cost per patient	*4,660 (100%)*	*5,607 (100%)*	*5,735 (100%)*	*6,379 (100%)*	*1,755 (100%)*	*2,152 (100%)*	*1,813 (100%)*	*2,168 (100%)*	*4,143 (100%)*	*4,347 (100%*	*4,718 (100%)*	*4,867 (100%)*

[a] Cost data from 2001. US$ 1= R8.57 (2001); N.A. = not applicable.

[b] Expected number of visits/hospital days for each site is as follows: 7 hospital days for site A; 3 visits for monitoring at each site except at site A where there are only 2 such visits; 130 visits for DOT (sites B, E and F), 123 visits for DOT (site A), and 10 visits for DOT (sites C and D); 120 visits to 'treatment supporter' (sites C and D).

[c] Expected number of diagnostic tests for each site: 4 sputum smears (site A), 7 sputum smears (site B), and 4 sputum smears (sites D-F); 1 sputum culture (sites A and B); 3 X-rays (sites A and B).

7.3.3 Patient costs

There were no patient costs associated with TB treatment in the public-private for-profit model because the treatment is workplace-based. The cost to the patient in the purely public model was between 2.6 and 3.3 times higher than the public-private non-profit model reflecting less time that a patient had to spend getting the treatment in the community and lower transport cost (Table 7.5).

Average financial costs included travel costs associated with visits for monitoring and DOT. They ranged between R14 (site D) and R225 (site F). The travel cost to the patient is sites E and F were between 10 and 16 times the cost to the patient in sites C and D reflecting lower transport cost associated with DOT visit to community treatment supporters. In addition to the travel cost, average economic patient costs associated with TB treatment included time costs. They ranged between R315 (site D) and R1 048 (site F).

Table 7.5: Mean patient costs associated with tuberculosis treatment for each site, 2001 US$ (lower and upper limits of 95% confidence interval)[a]

Cost category	Public-private non-profit model				Purely public model			
	Site C		Site D		Site E		Site F	
	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic
Visit to clinic for monitoring								
- travel cost	4 (3-6)	4 (3-6)	3 (2-5)	3 (2-5)	5 (5-6)	5 (5-6)	4 (3-4)	4 (3-4)
- time cost	N.A.	13 (8-14)	N.A.	11 (5-12)	N.A.	16 (13-18)	N.A.	21 (19-26)
Visit to clinic for DOT								
- travel cost	14 (12-15)	14 (12-15)	11 (9-14)	11 (9-14)	220 (210-231)	220 (210-231)	170 (157-200)	170 (157-200)
- time cost	N.A.	40 (26-57)	N.A.	31 (26-35)	N.A.	632 (603-652)	N.A.	853 (790-961)
Visit to "treatment supporter" for DOT								
- travel cost	0	0	0	0	N.A.	N.A.	N.A.	N.A.
- time cost	N.A.	264 (202-316)	N.A.	238 (206-254)	N.A.	N.A.	N.A.	N.A.
Total cost per patient	*18 (16-19)*	*336 (240-408)*	*14 (12-16)*	*315 (248-320)*	*225 (201-242)*	*872 (831-906)*	*174 (148-209)*	*1,048 (969-1,191)*

[a] Cost data from 2001. US$ 1 = R8.57 (2001); N.A. = not applicable.

7.3.4 Average societal cost of treatment

The costs of TB treatment were largely financed by the main provider in each site (Table 7.6). The private for-profit providers financed 93-95% of the total cost with a small 5-7% contribution required from the Provincial TB Programme. In contrast, the provincial TB Programme contributed 24-27% of financing towards private non-profit sites, with the public sector also paying for another 20% of costs. However, in budgetary terms this meant that the provincial TB Programme contributed only up to twice the amount of funding to the public-private non-profit sites as it did for the public-private for-profit sites, reflecting the much lower cost per patient treated (R2 483) in the public-private non-profit sites versus the public or the public-private for-profit sites.

The main differences between financial and economic costs are attributable to the cost of subsidised drugs (site A), the opportunity cost of treatment supporter's time and the subsidy to the NGOs (sites C and D), and the annualized capital costs (all sites) reflecting the opportunity cost of capital. The government subsidy to the private provider in Site B has not influenced the cost substantially in this site.

Table 7.6: Average societal cost of treatment per patient at each site, 2001 Rand (% of total)[a]

Cost category	Public-private for-profit model				Public-private non-profit model				Purely public model			
	Site A		Site B		Site C		Site D		Site E		Site F	
	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic
Public provider	*N.A.*	*N.A.*	*N.A.*	*N.A.*	*388 (22%)*	*504 (20%)*	*399 (22%)*	*541 (20%)*	*3,609 (83%)*	*3,813 (73%)*	*4,184 (85%)*	*4,333 (73%)*
Private provider	*4,660 (100%)*	*5,216 (93%)*	*5,735 (100%)*	*6,067 (95%)*	*833 (47%)*	*1,038 (42%)*	*881 (48%)*	*978 (39%)*	*N.A.*	*N.A.*	*N.A.*	*N.A.*
Provincial TB Control Programme[b]	*N.A.*	*391 (7%)*	*N.A.*	*312 (5%)*	*534 (30%)*	*610 (24%)*	*534 (29%)*	*649 (27%)*	*534 (12%)*	*534 (10%)*	*534 (11%)*	*534 (9%)*
Patient	*N.A.*	*N.A.*	*N.A.*	*N.A.*	*18 (1%)*	*336 (13%)*	*14 (1%)*	*315 (13%)*	*225 (5%)*	*872 (17%)*	*174 (4%)*	*1,048 (18%)*
Total costs	*4,660 (100%)*	*5,607 (100%)*	*5,735 (100%)*	*6,379 (100%)*	*1,733 (100%)*	*2,488 (100%)*	*1,828 (100%)*	*2,483 (100%)*	*4,368 (100%)*	*5,219 (100%)*	*4,892 (100%)*	*5,915 (100%)*

[a] Cost data from 2001. US$ 1= R8.57 (2001); N.A. = not applicable.

[b] Provincial TB Programme covered the cost of drugs in all the sites except in site B where a reimbursement on a patient day basis was provided. In addition to the drugs, the Programme also covered the cost of diagnostic tests in sites C – F.

7.3.5 Average cost for each model of delivery

Table 7.7 below summarises the average cost per patient treated for each model of delivery of TB treatment. The public-private non-profit model had the lowest economic cost per patient treated, followed by the purely public model and the public-private for-profit model of delivery. The greatest variability in cost per patient was within public-private for-profit model and within the purely public model reflecting different prices paid for inputs by different sites, different mix of inputs used by different sites, and different levels of staff productivity.

Table 7.7: Average cost of treatment per patient for each model of delivery, 2001 Rand (% of total)[a]

	Public-private for profit model		Public-private non-profit model		Purely public model	
	Financial	Economic	Financial	Economic	Financial	Economic
Public provider	N.A.	N.A.	388–399	504–541	3,609–4,184	3,813–4,333
Private provider	4,660–5,735	5,216–6,067	833–881	978–1,038	N.A.	N.A.
Provincial TB Control Programme	N.A.	312–391	534	610–649	534	534
Patient	N.A.	N.A.	14–18	315–336	174–225	872–1,048
Total cost per patient	*4,660–5,735*	*5,607–6,379*	*1,769–1,831*	*2,483–2,488*	*4,317–4,943*	*5,219–5,915*

[a] Cost data from 2001. US$ 1= R8.57; N.A. = not applicable.

Compared with the public sector provision, the sites emphasizing community involvement in care were almost always associated with a large overall reduction in the financial cost per patient treated. On average, this reduction was 79% for the public sector and 92% for the patient. The average financial cost per patient treated in the public-private for-profit model of delivery was between 7% and 14% higher than the cost in the purely public model.

7.3.6 Treatment outcomes

Table 7.8 shows treatment outcome for all new smear-positive cases in the cohort. The successful treatment completion rate ranged between 74% (site F) and 89% (site E) and the cure rate ranged between 65% (site C) and 87% (site E). The major influence on effectiveness were high mortality rates of 12% and 11% in sites 1 and 2 respectively, and high defaulting rates of 24% and 16% (and so lower cure rates) in sites C and F respectively which were the only 2 urban sites. On average, the effectiveness was better in sites E, A, D and B than in sites F and C. No one model performed unambiguously better than the others.

Table 7.8: Treatment outcome for a 12-month cohort of newly registered smear-positive pulmonary TB patients

Treatment outcome	Public-private for-profit model		Public-private non-profit model		Purely public model	
	Site A	Site B	Site C	Site D	Site E	Site F
	N=95	N=423	N=355	N=50	N=85	N=174
Completed	83 (87%)	368 (87%)	283 (80%)	41 (82%)	76 (89%)	129 (74%)
Cured	79 (83%)	321 (76%)	231 (65%)	41 (82%)	74 (87%)	121 (69%)
Defaulted	1 (1%)	8 (2%)	59 (16%)	5 (10%)	8 (9%)	41 (24%)
Died	11 (12%)	47 (11%)	13 (4%)	4 (8%)	1 (1%)	4 (2%)

Source: Reports submitted to the Provincial TB Programmes.

7.3.7 Cost-effectiveness of TB treatment

A provider-only perspective shows the most cost-effective TB treatment was the public-private non-profit model reflecting both lower cost per patient treated and relatively higher treatment completion and cure rates (Table 7.9). The least cost-effective TB treatment was the public-private for-profit model, where sites achieved relatively higher successful treatment completion and cure rates, but the average costs per patient treated were the highest.

Table 7.9. Cost-effectiveness for each model of treatment provision in 2001 Rand[a]

	Public-private for-profit model		Public-private non-profit model		Purely public model	
	Site A	Site B	Site C	Site D	Site E	Site F
Cost-effectiveness from the provider perspective						
Total cost of treating patient	654	744	251	253	507	568
Successful treatment completion rate	87	87	80	82	89	74
Cure rate	83	76	65	82	87	69
Cost per new smear-positive patient successfully treated[b]	752	855	314	308	570	767
Cost per new smear-positive patient cured[c]	788	979	386	308	583	823
Cost-effectiveness from the patient perspective						
Total cost of treating patient	N.A.	N.A.	39	37	102	122
Successful treatment completion rate			80	82	89	74
Cure rate			65	82	87	69
Cost per new smear-positive patient successfully treated			49	45	115	165
Cost per new smear-positive patient cured			60	45	117	177
Cost-effectiveness from the social perspective						
Total cost of treating patient[d]	654	744	290	290	609	690
Successful treatment completion rate	87	87	80	82	89	74
Cure rate	83	76	65	82	87	69
Cost per new smear-positive patient successfully treated	752	855	362	354	684	932
Cost per new smear-positive patient cured	788	979	446	354	700	1 000

[a] Cost data from 2001. Average exchange rate prevailing in 2001 US$1 = R8.57.

[b] Cost-effectiveness indicator estimated as a ratio between the number of new smear-positive patients registered and the number of number of new smear-positive patients successfully treated.

[c] Cost-effectiveness indicator estimated as a ratio between the number of new smear-positive patients registered and the number of number of new smear-positive patients cured.

[d] This represents a sum of provider and patient costs for each site.

From the patient's perspective, the most cost-effective TB treatment was the public-private for-profit model (TB treatment was workplace-based and the employer covered the cost of transport), followed by the public-private non-profit model (TB treatment was community-based and accessible to the patient). The least cost-effective was the purely public model, reflecting long waiting hours and poor geographical accessibility of public clinics. From the social perspective, the public-private non-profit model remained the most cost-effective model of all the models of provision. However, from a societal perspective, there were similar ranges for cost-effectiveness between the public-private for-profit model and the purely public model.

7.3.8 Sensitivity analyses

The results were robust in sensitivity analyses (Table 7.10) with cost and cost-effectiveness assumptions most sensitive to valuation of staff time. The relative rankings remained the same. Sensitivity analysis using the number of registered patients adjusted by the number of the patients who died during the treatment showed that results were not sensitive to plausible variability in the effectiveness data. Cost-effectiveness in the higher HIV prevalence sites improved considerably when compared to other study sites.

Table 7.10: Sensitivity analyses

Scenario	Public-private for-profit model		Public-private non-profit model		Purely public model	
	Site A	Site B	Site C	Site D	Site E	Site F
Alternative estimates of provider costs (staff time)						
• % divergence from base-case provider cost estimate	-15%	-13%	-8%	-8%	-24%	-28%
• % divergence from base-case provider cost-effectiveness estimate	-15%	-13%	-8%	-8%	-24%	-28%
Lower limit patient cost						
• % divergence from base-case patient cost estimate	N.A.	N.A.	-5%	-5%	-5%	-5%
• % divergence from base-case patient cost-effectiveness estimate	N.A.	N.A.	-4%	-3%	-1%	-1%
Upper limit patient cost						
• % divergence from base-case patient cost estimate	N.A.	N.A.	+5%	+5%	+5%	+5%
• % divergence from base-case patient cost-effectiveness estimate	N.A.	N.A.	+3%	+0.2%	+0.6%	+2%
0% discount rate						
• % divergence from base-case provider cost estimate	-3%	-3%	-3%	-3%	-3%	-3%
• % divergence from provider cost-effectiveness estimate	-2%	-0.6%	-0.5%	-2%	-1%	-0.5%
6% discount rate						
• % divergence from base-case provider cost estimate	+3%	+3%	+3%	+3%	+3%	+3%
• % divergence from provider cost-effectiveness estimate	+3%	+2%	+2%	+3%	+2%	+2%
Effectiveness adjusted by the death rate						
• % divergence from base-case successful treatment rate	-12%	-11%	-4%	-8%	-1%	-2%
• % divergence from base-case societal cost-effectiveness estimate (successful treatment rate)	-12%	-11%	-4%	-8%	-1.6%	-2.5%
• % divergence from base-case cure rate	-12%	-11%	-4%	-8%	-1%	-2%
• % divergence from base-case societal cost-effectiveness estimate (cure rate)	-12%	-11%	-4%	-8%	-1%	-2%

N.A. = not applicable.

7.4 Public sector financing

As explained in chapter 6, the provincial TB Control Programmes in the study provinces provided a subsidy to the private providers. This section discusses financing of the TB treatment in the study models, in particular the role of public sector financing in each of the models. First, detailed discussion on subsidies is presented. Different level of resources provided by the public and private sectors, and by the patient, is then presented. The section ends with a discussion on the cost-effectiveness of different models of delivery of TB treatment from the public sector's perspective.

7.4.1 Subsidies to the private providers

In site A, the subsidy was in the form of free drugs for all TB patients registered. In site B, the private provider was reimbursed for all patients registered with a minimal sum of R312 per patient (R2.4 per outpatient visit). Sites C and D received financial support for training of treatment supporters, co-ordination and administration of the community-based TB treatment, and R10 worth of incentives per patient's month for each treatment supporter. These subsidies are presented in Table 7.11 and discussed in detail below.

Table 7.11: Subsidy from the provincial TB Control Programme for each new-smear positive patient (2001 Rand)

Public-private for-profit model		Public-private non-profit model	
Site A	**Site B**	**Site C**	**Site D**
391[a]	312[b]	76[c]	115[d]

[a] the cost of drugs at government tender prices
[b] R2.4 per visit
[c] R12 for co-ordination and administration, R4.4 for training of treatment supporters, and R60 for incentives for treatment supporters
[d] R48 for co-ordination and administration, R6.8 for training of treatment supporters, and R60 for incentives for treatment supporters

From the private for-profit provider's perspective in site A, the drugs provided by the provincial TB Control Programme lowered the total private provider cost by 39%. The drugs, for which the provincial TB Control Programme has paid R391 at the state tender prices, were priced seven times higher in the private market. If the provider in site A were to purchase the drugs from one of the local pharmaceutical companies it would cost around R3 000 for a new smear-positive patient. Therefore, from the private for-profit provider in site A, the subsidy represents considerable saving. In site B, however, where the provincial TB Control Programme reimbursed the private for-profit provider with R312 for a new smear-positive patient, the overall costs were only reduced by 5%. If the private provider in site B received free drugs, as was the case with the private provider in site A, the cost of treating a new smear-positive TB patient to the private provider would have decreased by 53%.

From the private non-profit providers' perspective in sites C and D, the cost of subsidy per patient that they received from the provincial TB Control Programme was R76 and R115 respectively. This subsidy covered around 9% of the total cost in site C and 13% of the total cost in site D. In sites C and D, each private non-profit provider received an annual sum of R24 000 for co-ordination costs and an annual sum of R2 200 for administration costs, regardless of number of patients registered to be supervised in the community. The part of the subsidy that covered training of treatment supporters related to the number of treatment supporters trained in a year. The part of the subsidy that covered incentives for treatment supporters was the same for both providers – R10 per a patient per month. The cost of the subsidy per patient treated in the community depended on the total number of patients registered to be supervised in the community in a year. Since the TB community-based programme in site C had four times more TB patients under supervision than the community-based programme in site D, the cost of the subsidy per patient in site D was 1.5 times higher than in site C.

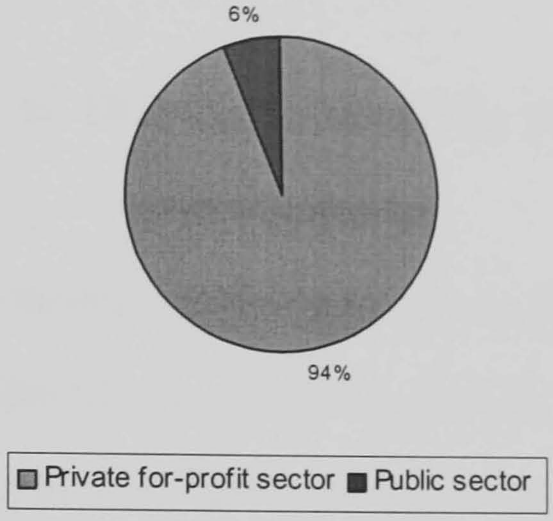
From the provincial TB Control Programme's perspective, it cost between R312 and R391 to have a patient treated in sites B and A respectively, and between R1 114 and R1 190 (cost to both the public health services and the provincial TB Control Programme) to have a patient treated in sites C and D respectively. Compared with the treatment in the purely public sector, it was, on average, 12 times less costly to have patients treated in the public-private for-profit partnership, and almost 4 times less costly to have a patient treated in the public-private non-profit partnership, than in the purely public sector. However, as not all TB patients could be offered treatment in the PPPs, these estimates only give an indication of what inputs are needed for a PPP from a perspective of the government.

The availability of the treatment at a workplace (sites A and B), and in the community (sites C and D) resulted in substantial savings to the patient. There were no patient costs associated with the treatment in the employer-based facilities (i.e. public-private for-profit partnerships), and the cost to the patient supervised in the community was, on average, 3 times lower than in public sector facilities.

7.4.2 Cost borne by the public sector in different public-private models

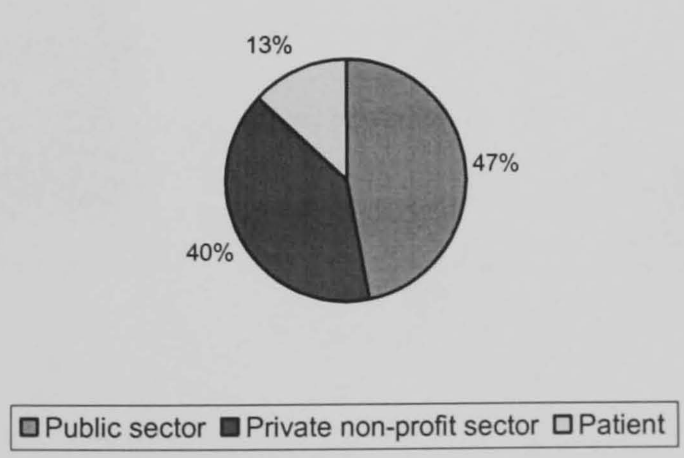
Figures 7.1 and 7.2 below illustrate the level of resources provided by the public sector in each of the public-private models of delivery of TB treatment.

Figure 7.1: Level of the resources provided by the public and private sectors in the public-private for-profit model of delivery, in %



For the public-private for-profit model of TB treatment delivery, around 6% of the costs were borne by the public sector, and 94% were borne by the private sector. There were no costs to the patient. In this model of delivery, public funding covered the cost of drugs (in site A) and the cost of reimbursement (in site B).

Figure 7.2: Level of resources provided by the public/private sectors and patient in the public-private non-profit model of delivery, in %

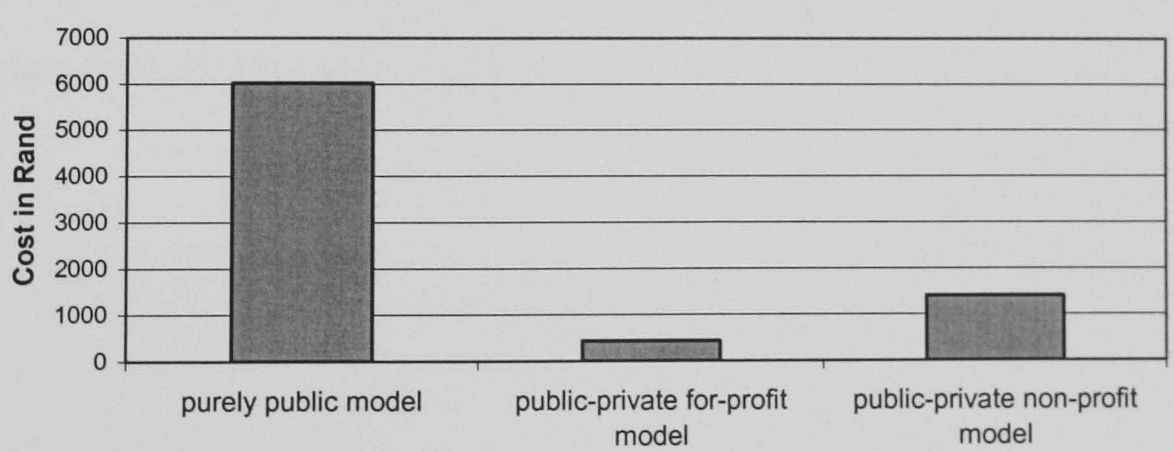


For the public-private non-profit model of delivery, around 47% of the costs were borne by the public sector, around 40% were borne by the private provider, and around 13% were borne by the patient. The main cost to the private non-profit providers was the cost of managing the community-based programmes.

7.4.3 Cost-effectiveness of TB treatment from the perspective of the public sector

In the two public-private models of delivery of TB treatment, increased community involvement and availability of treatment at a workplace were almost always more affordable and cost-effective to the public sector than purely public sector clinic-based approach to TB treatment (see Figure 7.3 below). The cost-effectiveness results show that, in comparison to purely public provision, the public-private partnership models could reduce cost per patient cured to the public health sector by 93% (in the public-private for-profit model) and 77% (in the public-private non-profit model).

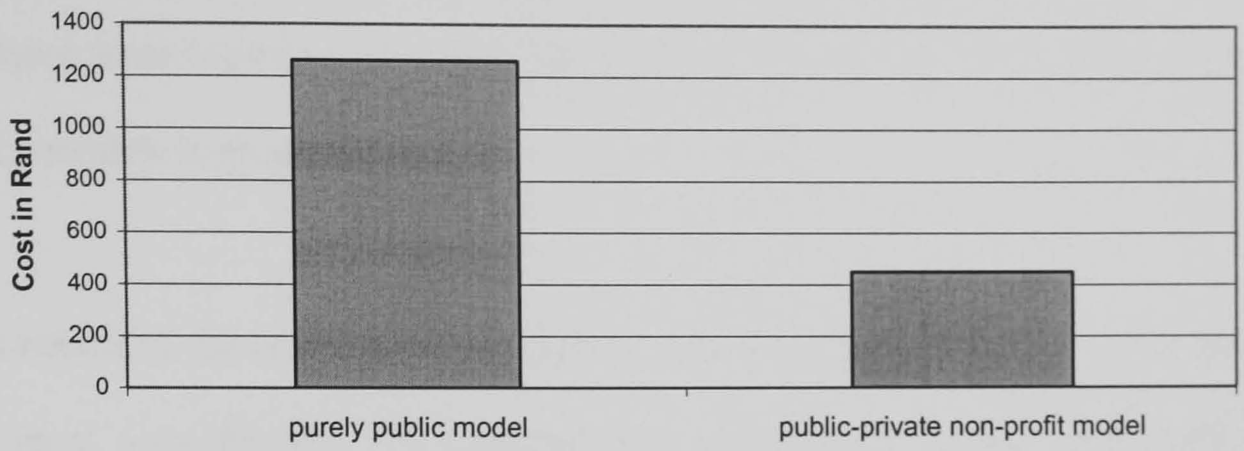
Figure 7.3: Cost per patient cured borne by the public sector in different models of treatment delivery (2001 Rand)



The new costs associated with the community-based treatment (i.e. overall supervision, training and incentive for treatment supporters) to the public sector were small in comparison with the cost-saving realised by reducing the number of patients supervised in the purely public clinic. In the public-private non-profit model, the main reason for the reduction in cost was that the incentive paid to community treatment supporters (R3 per DOT visit on average) were much lower than the average cost of a clinic visit (R30 per DOT visit on average), and not outweighed by the new cost associated with training and overall supervision of treatment supporters.

In addition to the cost reduction to the public sector, by providing TB treatment to poorer community members and employees, the treatment became more accessible and convenient for patients in both study populations. From the patient perspective, due to the fact that the mining health services provided transport for their patients and the treatment was workplace-based, there were no costs associated with treatment. For patients supervised in the community, costs were saved because the time taken to get to treatment supporter and the travel expenditures incurred to do so were lower than those associated with visits to health clinics. Figure 7.4 below shows that public-private non-profit partnership model could reduce cost to the patient supervised in the community by 64%.

Figure 7.4: Cost per patient borne by the patient in purely public and public-private non-profit models of treatment delivery (2001 Rand)



While costs generally fell overall, and from the perspective of the private for-profit providers and patients, it is important to highlight that costs increased from the perspective of the provincial TB Control Programmes and the NGOs specialising in TB care. This shows that the introduction of new, more efficient approaches to delivery of TB treatment care may require extra investment in TB Control Programmes and NGOs involved in TB service delivery. In particular, a provincial TB Control Programme may require resources to be allocated to it in order to facilitate overall cost reductions for both patients and the health sector as a whole.

7.5 Conclusion

This chapter evaluated the cost-effectiveness of selected public-private partnership models of delivery of TB treatment in South Africa. Three different models of provider partnerships were evaluated and compared for different study populations: public-private for profit (employer-based), public-private non-profit (non-governmental organisations), and purely public. Cost and effectiveness data for 2001 were collected at 6 sites representing the three different models of provision. The evaluation was undertaken from the perspective of the provider, the patient and the society. Both financial and economic costs were presented. Effectiveness was measured using cure and successful treatment completion rates. Four sensitivity analyses were conducted. Finally, a discussion of the public sector financing in each of the models is presented.

The results of the cost-effectiveness show that, from the perspective of the *provider*, the most cost-effective TB treatment was in the public-private non-profit model reflecting both lower cost per patient treated and relatively higher treatment completion and cure rates. The least cost-effective was the public-private for-profit model. From the *patient's* perspective, the most cost-effective TB treatment was in the public-private for-profit model, and the least cost-effective was the purely public model. From the *social* perspective, the public-private non-profit model of delivery of TB treatment remained the most-effective model of all the models of delivery.

The study results also show that, in comparison with the purely public provision, the public-private partnership models could significantly reduce costs to both the public health sector and patient by 77% - 93% and 64% - 100% respectively, and increase cost-effectiveness of TB treatment. In addition, TB treatment provided through the public-private partnerships seems to be more accessible and convenient for patients in both study populations (i.e. employees and poorer community members).

Cost-effectiveness data presented here suggest that the existence of the public-private partnerships could lead to substantial savings to the public sector. Taking into consideration the rising number of TB cases as a result of the HIV/AIDS epidemic, the cost per patient treated to the public sector could be reduced by enhanced partnership between the private and public sectors. However, the cost-effectiveness study has a number of limitations, as discussed further in chapter 9. Non-randomised purposive sampling was used to identify sites that reflected communities and locations where PPPs are currently in place. Thus the sites varied significantly by TB incidence due to the nature of the PPP target groups. Although efforts were made to try and select sites with similar HIV prevalence rates, the nature of the PPP target groups and scarcity of data on HIV prevalence made this difficult. As there is a higher mortality rate associated with HIV status of TB patients, it was not possible to control for the fact that TB treatment outcomes might have been poorer in sites with a higher HIV prevalence rate than in sites with a lower HIV prevalence rate. This could underestimate the cost-effectiveness at higher HIV/TB incidence sites. The PPPs were all relatively well functioning (with cure rates well above the South African average of 55%). The purposive sampling may have led to identification of better-functioning PPPs, which may suggest that results are optimistic. The conventional practice of using average reported incomes among a sample of patients is used to value patient time. This might have under or over-estimated true costs.

Overall, these public-private partnerships show that there is a strong economic case for expanding the private sector (i.e. workplace and community) involvement in TB treatment in South Africa. Expansion may require increased investment in the public-private partnerships, but they seem to be capable of delivering important improvements in the affordability and efficiency of TB treatment, and improving the South African health system's capacity to cope with the impact of the HIV/AIDS epidemic.

Chapter 8

INCENTIVE DESIGN AND DIFFERENT MODELS OF PUBLIC-PRIVATE PARTNERSHIPS

8.1 Introduction

Chapters 6 and 7 have presented the methods and findings of quality of care and cost-effectiveness evaluations of two different models of public-private partnerships for the provision of TB treatment. The main conclusions are that the quality of care is superior in both public-private partnership models when compared to the purely public sector. In terms of the cost-effectiveness, the main conclusions are that, from the provider's perspective, the public-private non-profit sites are the most cost-effective and the public-private for-profit sites are the least cost-effective. From the patient's perspective, however, the most cost-effective TB treatment is in the public-private for-profit sites, and the least cost-effective is in the purely public sites. The findings show that, in light of the TB/HIV epidemic, increased collaboration with private providers through partnerships could potentially improve both the quality of care and cost-effectiveness of TB treatment.

The evidence supports the call for an increased role for the private sector. However, as discussed in chapter 2, economic theory suggests that problems are likely to arise in any principal-agent relationship as the agent is given scope for opportunistic behaviour (McPake at al., 2002). Principal-agent theory indicates that incentives are important for successful public-private collaboration, but due to asymmetries of information their operation may be problematic. In addition, previous experience suggests that, because of differences in motivation between public and private sector actors, broader involvement of private actors raises additional issues of appropriate incentive mechanisms that can be used to achieve converging public-private interests than if we were just looking purely at a public model of delivery alone (Mills et al, 2001). This chapter focuses on understanding motivations to consider actual and potential participation of public/private partners for the provision of TB treatment, and based on the motivations, incentive structures suitable for different providers.

How to design institutions that provide good incentives for economic agents has become a central question of economics (Laffont and Martimort, 2002). Section 2.2.7 in chapter 2 discussed the economic theory of incentives in the context of agency relationships as its basis. New institutional economic theory suggests that problems are likely to arise in any principal-agent relationship as the agent is tempted to pursue his/her own goals at the expense of those of the principal due to asymmetric information (North, 1990). Though the problems of the principal-agent relationship are unavoidable in health care, creating appropriate incentives for agents and monitoring and sanctioning of agent behaviour are some of the ways for solving the market failure (Mills et al., 2001). How different providers in the health care system are paid can have an impact on their behaviour, and therefore on the achievement of the objectives of the health system.

The aim of this chapter is to explore motivations of partners within existing partnerships and incentive mechanisms attributable to different models of public-private partnerships. It also aims to explore potential private partners in the provision of TB treatment, and incentive structures for broader public-private partnerships.

In the first part of this chapter, the methods used for identifying and exploring motivations and incentives are presented. Analysis of interview data and methods for ensuring validity and rigour of the qualitative data are then explained. In the second part, the motivations for participation in existing partnerships are highlighted, and incentives of existing partners in public-private TB arrangements are explored. Potential private partners are then identified and obstacles to private provision of TB treatment explored. Finally, potential partners' motivations for partnership with the government and the incentive structures that may be needed for a well-functioning partnership are presented.

8.2 Methods

8.2.1 Semi-structured interviews

Using a convenience sample, a total of fourteen semi-structured interviews were conducted with Department of Health officials (n=5), private for-profit providers (n=3), private non-profit providers (n=2), and potential partners (n=4). This included national policy-makers, provincial TB control programme managers, medical service directors in the mining and textile industries, NGO directors, private commercial clinic managers, and independent practitioner association directors. The main justification for the chosen sample size is that the interview schedule was long and conducting interviews time consuming. There was no fixed framework for interviews and they were open-ended and exploratory (see Appendix IX for interview schedules). Key areas explored with government officials and private providers in partnerships related to: (a) the main characteristics of the partnership;

(b) motivations for participation in partnership with the government/private providers; and, (c) incentive mechanisms attributable to different partnerships.

These interviews were also used to identify private providers who might potentially become partners in the provision of TB treatment. Using a snowball technique, four private providers who represented potential partners were then identified and interviewed. They included independent family practitioner associations, employer-based private providers in the mining industry, employer-based private providers in the textile industry, and private commercial clinic companies. Interviews with potential partners explored: (a) the main characteristics of the provider; (b) their perceptions of obstacles to providing TB treatment; (c) their motivations for wanting to enter into a partnership with the government; and, (d) incentive structures that would be needed for their involvement in partnership (see Appendix IX for interview schedule). The first round of interviews was carried out between March and August 2002, and the second round was carried out during October 2002.

8.2.2 Analysis of interview data

All interviews were taped and transcribed by the author. Transcripts were analysed using qualitative software NudIST[1] which is found to increase rigour and detail but not at the expense of conceptual thinking (Lewando-Hundt et al., 1997). The decision to use qualitative software NudIST was made because it was felt that it would minimise dependence on analysis via the arrangement of pieces of paper, and increase the accessibility of the data for interpretation by other researchers.

[1] Non-numerical Unstructured Data Indexing Searching and Theorising

Informal analysis of the interview data started early in the research process and many themes emerged during these earlier stages of analysis. Conversations with my supervisor about the output of the interviews also helped during the fieldwork phase. Transcription of interviews was undertaken during the interview period. A further process of interview data analysis then began by coding the transcripts using NudIST. Text was coded to the following themes: main characteristics of the partnership; motivations for getting involved in partnership; incentive mechanisms attributable to different existing models of public-private partnership; obstacles to providing TB treatment in the private sector; motivations of potential private partners for partnership with the government; and, incentives that may be needed for a well-functioning partnership. After this initial open coding, each set of themes was examined in greater detail and where necessary the introduction of new themes or sub-themes took place. Presentation of results in this chapter followed the themes.

8.2.3 Ensuring validity and rigour

A common criticism of qualitative research is that data collection and analysis is non-standardised and subjective and therefore may lead to bias due to the researcher's expectations. Several steps were takes to enhance validity in this study. First, in order to ensure completeness and clarity, all interview schedules were circulated to my supervisor and colleagues for comments and tested prior to use. Second, in order to enhance the validity of the data and analysis, interviewees were mailed a brief follow-up questionnaire asking for their reactions to the interviews. Lastly, once the data had been coded, the author held follow-up telephone interviews with respondents to ensure that she interpreted what they had said correctly.

8.3 Results

This section is divided into two parts. In the first part, the findings on the motivations of existing partners for participating in partnerships in the provision of TB treatment are summarised. The incentive mechanisms attributable to different partnerships are also discussed. The second part focuses on potential private partners, discussing obstacles to providing TB treatment in the private sector, the motivations for partnership, and incentives that may be required to support development of broader public-private partnerships.

8.3.1 Motivations of partners within existing partnerships

Motivations of the government for partnerships with private providers

Government officials interviewed for this research gave remarkably similar answers to the question of why the government had agreed to the partnership with the private provider. Improving TB programme through better compliance, increased cure rates and accessibility to treatment, implementing the national TB guidelines and policy, and having a unified system of reporting outcome of the treatment were the main motivations for the government to subsidise both the mining companies and the NGOs in the provision of TB treatment. Integrating private providers' efforts in TB treatment with the government TB control programme activities, and increasing the knowledge of TB in the community are the additional motivations for government to have the private providers on board.

In the case of private for-profit providers, the mining companies have the resources to treat a lot of TB cases and the government wants to have a unified TB control programme.

> *"I think it is important that the state maintains control, and the cost of maintaining control is you provide the fixed dose combination drugs according to what you want your schedule to be and that way you keep control of quality and exactly what the regimens are"* (Government official, Western Cape)

> *"I think the main thing is you can't handle or can't implement any programme if all partners are not part of your programme...it doesn't help to say it is us here and you there because we are working with the patients and everything is for the benefit of your patients. So, it is better to have partnership. That is what I am trying and doing with all the partners within the TB programme...to have one big family to address the problems"* (Government official, North West)

> *"the bottom line is that it decreases the infectiousness in the community. It cures our patients and though we use their manpower to do that we benefit all the way. And they also benefit, it is a win-win situation"* (Government official, Free State)

Declining resources in the public sector motivated the government to start looking at other options. One of the options is a community-based TB treatment programme run by the local NGOs. This option of delivering TB treatment is more cost-effective than the purely public provision of TB treatment, and is more convenient for the patient (Sinanovic et al., 2003). By providing financial support to the NGOs to run community-based TB programmes, TB patients have the option of where they want to be supported for the duration of their treatment which potentially could improve compliance. The NGOs are also seen as an important player in strengthening the TB programme with various responsibilities such as advocacy and health education, follow up of the treatment interrupters, direct treatment observation, and training.

> *"with the increasing number of TB clients that we are seeing per year, really we are just creating bottlenecks at services providers, and because the budget is not getting any bigger we've got to look at other options of how we can provide the support to our TB clients. It really comes down to rands and cents and economy of scale and all the rest of it"* (Government official, Western Cape)

> *"we are definitely more efficient because we can't handle such a large number of patients in our clinics"* (Government official, Free State)

> *"I think one has to go from a cost point of view. These community DOT programmes are definitely the cheaper option to the service provider"* (Government official, North West)

The private providers were also asked about the government's motivations for partnerships. The two mining companies mentioned that the government recognised that the mining companies have a role to play, because they are large employers, and need to fulfil the obligations of the law where TB in a mine setting is occupational and they, therefore, had to provide treatment to their workers. The following quotes best illustrate their opinions about the government's motivations.

> *"...because we have got programmes in place that work. Because we employ a lot of people, we treat a lot of TB cases and we've got the infrastructure and the money to support these programmes"* (Medical services director, mining company A)

> *"I think they realise we are a big player in this area. We are treating not just our people but lots of contractors and dependents. We treat our own people so if they don't get statistics from us, their figures are obviously totally wrong. I mean, because then they only report on what they treat which will exclude the mining sector. And we know that the mining sector has got a high TB incidence rate"* (Medical services director, mining company B)

However, the interviews found that perceptions did not always correspond to facts. Whilst the mining companies are legally bound to provide TB treatment to their employees, one of the respondents explained that the financing and provision of TB treatment is the responsibility of the government.

> "*well, whose problem is TB? Is it really a mining problem? It is a notifiable disease. I think it is the state's problem. The other half of my feelings is that it is also a mining problem. If you look at their TB policy they cannot refuse in treating anybody so in other words we can actually take our 248 TB patients per day and dump them on the clinic and they must treat which will be chaos. But it will also be chaos for us. So, yes, there has to be a partnership on both sides*" (Medical services director, mining company C)

The NGOs mentioned that the government had realised that TB cannot be controlled without a collaboration with other stakeholders such as community-based NGOs. However, they also recognised that the government sees them as just another service provider.

> "*what the health department wants out of the NGOs is to make sure that they get their money's worth in having service providers. I don't think there is motivation, human consideration in it for benefit to the patient. It is just cold hard facts*" (Director, NGO A)

Motivations of different private providers for public-private partnerships

The interviews found that the main motivations for the two mining companies are profit and access to information. This is achieved by improving their own TB programmes through measuring the treatment outcomes more accurately by using the government guidelines, controlling TB epidemic amongst their workers (and in the community), and keeping incidence rate as low as possible.

> "*we want to prolong our worker. It is a mutual relationship. They will continue to work while they are healthy and we will keep them healthy*" (Medical services director, mining company A)

"we are able to measure our outcomes more accurately and we benefit from open communication and education. Getting up-to-date information on new organisation protocols, and getting involved with people working in the same subject, and getting invited to seminars and so on. And, I believe, that the programme that has been put together by the Department of Health is a comprehensive one" (Medical services director, mining company B)

Another view is more divided:

"that is a difficult one because I would like to get more money out of them, that is for sure. I am part of their work group, this is a five-year plan to stop TB and so it is on the agenda already so I really would like to get either the treatment (drugs) or at least an increase in our subsidy. But that is not the only thing - it is a learning curve for both of us. I think we work well together" (Medical services director, mining company C)

When asked who initiated the partnership with the private for-profit providers, one of the directors of the medical services in the mining company mentioned that:

"it was the government's initiative because, you know, if they had to take over all our TBs and treat them, it will be a loss to them. It will also be a loss to us because, I mean we cannot provide transport, put everybody on a bakkie, take them to the nearest clinic where they sit all day and then go back to work maybe next day. It will be a loss for both of us if we have to take our people to a clinic for treatment" (Medical services director, mining company C)

Private non-profit providers (community level NGOs) mentioned that their main motivations are assisting the government in reaching its objective – controlling the TB/HIV epidemic - by involving the community to take ownership of the TB and HIV problems. They mentioned a combination of altruistic and financial motivations. Whilst community development and the care for the patient are the main motivations for getting involved in the partnership, financial support for their community-based TB programme related activities is equally important.

"it creates awareness of TB amongst everybody" (Director, NGO B)

"I think it is more cost-beneficial to the health service providers, and there is definitely a reduced cost for the patient because they are do not have to travel or take time from work. Because this is one of the things I feel is so often overlooked. We all shout about the cost to the service provider, but what is the cost to the patient" (Director, NGO A)

When asked about the private providers' motivations for the partnership, the government officials mentioned that the mining companies' reasons for the partnership were to improve their TB programme. Another view is that the legislation forces them to provide TB treatment:

"they are bound by law to do so. They have got no choice. Who would go on an extra expense which is costing them millions if they had a choice?" (Government official, North West)

The government officials, however, were not very clear about the motivations of the NGOs:

"well, I hope it is not profit! And I hope it is actually for the well being of the client. And the interest of the client and from a more holistic point of view, so yes, we hope it is that" (Government official, Western Cape)

"I think that the less formal organisations like the care groups do it because they care. But I think an organisation like SANTA does it for the money. And unfortunately the prospect of incentives has made that many unemployed people join NGOs to render service so that they can have most probably a job or they hope for a job in future. So I am not convinced that a non-profit organisation like SANTA doesn't do it for the money." (Government official, North West)

Data presented in this section suggests that private providers are influenced by both financial and non-financial set of motivations contained in the partnership with the government. From the government's perspective, improving the quality of TB treatment, compliance and accessibility were the main motivations for participation in partnerships with private providers for the provision of TB treatment.

8.3.2 Incentive mechanisms attributable to different public-private partnerships

The interviews found different incentive structures used in the existing public-private partnerships for the provision of TB treatment. They are summarised in Table 8.1 below.

Table 8.1: Incentive structures in existing partnerships

	Financial	**Non-financial**
Mining companies	• Profit maximization by minimising workdays lost due to illness • TB treatment drugs provided by the TB Control Programme • Reimbursement per patient day by the TB Control Programme	• Regulation (The Occupational Disease in Mines and Works Act of 1973) • Improving their TB programme by using the government treatment guidelines • Controlling TB epidemic • Training
Non-governmental organisations	• Direct government subsidy (funding of community-based TB programmes)	• Assisting the government in controlling TB epidemic • Good relationships with the government

In the public-private for-profit partnership (i.e. mining companies), the government provides a combination of financial and non-financial incentives. Provision of free drugs and financial subsidies (reimbursement per outpatient visit and inpatient day) are the main financial incentives provided to the mining companies for provision of TB treatment to their workers. Non-financial incentives provided to the mining companies are training on the national TB treatment guidelines, inviting representatives of the mining companies to participate in planning TB control activities, and creating an informal partnership with the public sector for the provision of TB treatment.

The mining companies that are reimbursed per outpatient visit and inpatient day complained that the reimbursement that they receive is unrealistically low and that they would instead prefer free drugs:

> *"...because I don't think R2.40 per outpatient is enough and I definitely don't think that anybody can stay in a hospital for R24 a day. I mean, if there is a hospital that can afford patient care for R24 a day, they will be very full"* (Medical services director, Mining company C)

The main incentive mechanism in the partnership with the non-profit providers appears to be financial. In this partnership, the government provides a direct annual subsidy to the community-based NGOs. The subsidy includes the payment of the district co-ordinator's salary, a portion of general administration costs, training costs and the payment of incentives to "treatment supporters". Non-financial incentives provided to the NGOs include inviting representatives of the NGOs to participate in planning TB control activities and improving the relationships between the public and private non-profit sectors.

What response do different incentives create?

In the case of one of the private for-profit providers, it was found that a low level of the provider payment (i.e. reimbursement per outpatient visit/inpatient day) created an incentive to control costs by reducing the length of stay in the hospital or not admitting TB patients to a mine hospital in the first place. It could have also potentially created an incentive to reduce the number of procedures per patient. Finally, this type/level of reimbursement could potentially create an incentive to reduce the number of cases detected and treated. The private provider clearly expressed a preference for free drugs in future.

For the companies receiving free drugs, however, this financial subsidy did not create an incentive to control costs:

> *"TB treatment (i.e. drugs) that we get for free is actually a bonus. Traditionally, we provided it ourselves. And then government came on board and said, well you are doing a good job, here is some free treatment. So that is really our set up. And as I say, we are a small little set up compared to other mines"* (Medical services director, mining company A)

Similarly, another mining company felt that there was more to it then free drugs:

> *"to control the TB epidemic is the first prize and to try and keep the incidence rate as low as possible. The free drugs was nice, you know, gesture, and I do think that is not the drive behind it. Obviously, they almost forced us to do exactly what they want and to throw open our books and our protocol and so on because we feel they are part of it."* (Medical services director, mining company B)

On the other hand, it was found that the subsidy the government provides to the community-based NGOs is project related which could potentially create incentives to spend the whole annual subsidy on a particular project regardless of whether it is spent in the most cost-effective way, as the NGOs are expected to return any unspent subsidies. However, their perceptions differ from this argument.

> *"you either going to provide a good service or you are not"* (Director, NGO A)

> *"we have provided support to TB patients voluntarily in the past, and with or without the subsidy, we will continue rendering a good service"* (Director, NGO B)

The evidence on the quality of care indicates that both models of public-private partnerships have superior quality of care when compared to the purely public sector. It can be argued that the drugs provided to the mining companies and direct subsidies to the NGOs have a positive impact on the quality of TB treatment, and that there are no major incentives to compromise with this aspect of service provision. In addition, the cost-effectiveness data presented in this study suggest that the existence of the public-private partnerships could lead to substantial savings to the public sector. This is particularly significant with the non-profit providers, suggesting that the use of a direct subsidy to the NGOs as an incentive structure could improve efficiency of the health system.

In summary, it appears that the existing public-private partnerships provide an incentive to encourage private sector participation, and thereby improve the quality of care and cost-effectiveness of TB treatment. If private providers see a positive benefit for their business and this outweighs possible drawbacks they are more likely to want to be involved. Drawbacks can include the opportunity cost of time spent in training, being monitored and providing information to the TB control programmes.

8.3.3 Potential partners in the provision of TB treatment

One of the key influences on the likely nature of the partnership is the nature of the market in which public-private partnerships take place (Palmer, 2001). Indicators of the nature of the market examined in this study include the potential private partners, obstacles to providing TB treatment in the private sector, and their motivations for partnership with the government. Each of them is briefly discussed below.

Potential private partners

Although working better with the private providers that are already in place is one way of improving the provision of TB treatment, involving new private providers may be useful in certain situations. These providers are, in some instances, particularly well placed to undertake activities such as provision of TB treatment – they may already be present in a targeted district, or may be heavily utilised by a targeted population. One of the objectives of this study was to identify a range of private providers who might potentially become partners in the delivery of TB treatment in a resource-limited setting. Table 8.2 overleaf summarises the main characteristics of four different private providers of TB treatment identified through interviews with government official and private providers.

Table 8.2: Characteristics of potential different private providers

Type of private provider	Location	Type of services provided	Population served
Commercial clinic company	Conveniently placed on the edge of residential and industrial areas	Primary health care, occupational health care and dental services	Cash paying patients, medical aid patients and capitation patients
Independent practitioners association	Poorer urban areas	Primary health care	Medical aid patients, capitation patients and cash paying patients
Employer-based health care provider (mining industry)	Mining company	Occupational health care	Company employees (mainly low income workers)
Employer-based health care provider (textile industry)	In the areas where the greatest concentration of the textile industry workers are either working or living	Primary health care, optical, dental and social workers services, and occupational health care	Textile industry employees and their dependents (mainly low income workers)

Obstacles to providing TB treatment in the private sector

The interviews with potential private providers explored the obstacles to private providers' participation in the provision of TB treatment. It was found that obstacles fall into three main categories:

(1) lack of access to diagnostic facilities and unavailability of drugs;

(2) inadequate knowledge and awareness of the national TB control guidelines; and,

(3) poor referral system and poor communication between the public and private sectors.

The cost of diagnosis and treatment of TB in the private practitioners' setting is extremely high and is not covered by the health insurance companies, as discussed in chapter 5. Despite the fact that diagnosis and treatment of TB is free of charge in the public sector there is demand for it in the private practitioners setting. This is intensified by the HIV epidemic that is not limited to the poorer members of the society who are dependant on the public sector. Access to using the public sector diagnostic facilities and drugs would make it possible for the private practitioner to provide treatment and follow the patient from diagnosis to completion of treatment.

A further obstacle mentioned was the lack of knowledge of the national TB treatment guidelines which is a major obstacle to providing a good quality treatment. When asked when last time contacted by officials from the Department of Health to inform them about the national TB treatment guidelines, all four potential private partners said they had not been contacted in the last 5 years.

The third type of obstacle mentioned was poor communication with the public sector officials and poor referral system. The interview found that this was mainly influenced by their experience with previous interactions with the public sector (e.g. through the provision of family planning services which were subsidised by the government). One respondent spoke of poor motivation amongst the health workers in the public clinics:

> *"they are de-motivated. They are overworked and, they think they are underpaid. While there is a big staff shortage it is enough to make them difficult"* (Director, employer-based provider – textile industry)

One of the private providers talked quite critically of the government's capacity to manage interactions with the private sector:

> *"on the state side, they are just not up to managing and it becomes a bureaucratic nightmare that we have to wade through"* (Director, employer-based provider - textile industry)

To summarise, obstacles to providing TB treatment in the private sector exist both on the side of the private providers lacking necessary knowledge about the TB treatment guidelines and on the public sector side lacking resources and capacity for interaction with private providers. In addition, TB treatment is costly to treat and private insurance for TB treatment is virtually non-existent. It appears that private providers are not willing to provide TB treatment. On the other side, there is reluctance by the government officials to get involved in interactions with private providers mainly because of their own lack of capacity for contract management. However, there appeared to be interest on both sides to improve the situation – government by organising workshops on the TB national guidelines and private practitioners by attending those workshops and putting TB on the agenda.

Motivations of potential private providers for partnerships with the government

The previous section noted that private providers had a number of reasons for not providing TB treatment. However, all potential private providers identified in this study are located in areas where the incidence of TB is very high. As medical schemes do not cover TB treatment, most of them refer around twenty TB patients a month to a nearest public clinic for diagnosis and treatment. The sense of frustration of having to refer TB suspects to the public clinics, and not being able to provide a full treatment to their own patients, is evident. When they were asked whether they would consider providing TB treatment in partnership with the public sector, all of the respondents said that whilst they are not prepared to provide TB treatment alone they would consider doing that in partnership with the government.

The question of what motivates private providers for wanting to get involved with the public sector in the provision of TB treatment is likely to be determined to some extent by whether private providers are operating for-profit or not for-profit, and whether they are self-employed individuals or part of a larger company structure. Potential private providers interviewed for this study gave various answers to this question. All of them mentioned both financial and non-financial motivations for partnership. Examples of reasons for financial and non-financial motivations for PPPs by potential partners are shown in Table 8.3 overleaf.

Table 8.3: Motivations of potential partners

Potential partner	Motivations
Commercial clinic company	*"firstly financial because we are a private set up"* *"it will make it more accessible for people to get their treatment"*
Independent practitioners association	*"we need to be paid for that service"* *"we are looking at holistic care for our client base. That is the only reason why I think we would go that route"* *"it is nice to see a patient and treat the patient until the very end"*
Employer-based service provider (mining industry)	*"well, I think there is obviously a cost saving if they do provide us with standard TB drugs as a minimum. That is purely sort of a monetary one, and in a non-profit organisation we are told to keep our costs down just as the state is"* *"we are involved with the community al large and we do realise that TB knows no boundaries. And it is not as if we can shut off the community from the mine or shut the mine off from the community, so we are inter-related in that way and obviously need to try and help the community at large"*
Employer-based service provider (textile industry)	*"providing a more comprehensive care for our members and certainly reducing the costs to us"* *"from a personal perspective, it is contributing to a bigger plan, meeting national health goals"* *"also for the patient it is less costly. If she has to arrive late at work every day for six months, it can put her under pressure"* *"you know, there are many advantages to it, the industry doing this for their workers, the union doing that for their workers. Remember that we are in a globalised environment now. There are advantages of having a social benefit programme for employees and for the unions"*

In summary, it was found that there are many potential providers who are not providing TB treatment to their patients but refer them to the public sector. Main obstacles to providing treatment are the lack of access to diagnostic facilities and unavailability of drugs, inadequate knowledge and awareness of the national TB control guidelines, and poor communication between the public and private sectors. They have both financial and non-financial motivations for partnership with the government. Based on the motivations, type of the provider, location and the population they serve, incentive mechanisms that may be needed for a well-functioning partnership could be devised. The next section summarises the incentive mechanisms that the potential private providers interviewed for the study found to be necessary for a well-functioning partnership for the provision of TB treatment with the government.

8.3.4 Incentives structures for broader public-private partnerships

It has been shown that private providers face obstacles to providing TB treatment, and that therefore they are not willing to provide TB treatment alone but in partnership with the government. Potential partners were asked what incentive structures incentives would encourage them to provide TB treatment. Table 8.4 below summarises their answers.

Table 8.4: Incentive structures for broader involvement of private providers

	Financial	Non-financial
Commercial clinic company and private practitioners	• Provide free TB treatment drugs • Make appropriate payment for each patient treated	• Provide training on TB treatment guidelines • Provide access to use the public sector diagnostic facilities and equipment
Employer-based providers	• Provide free TB treatment drugs	• Provide training on TB treatment guidelines • Provide access to use the public sector diagnostic facilities and equipment • Build a good relationship with the government

In addition to the financial and non-financial incentives shown in the table above, both the private practitioners and commercial clinic companies mentioned other benefits that they would derive by being able to provide TB treatment. They include broadening the service range, maintaining their client base, and attracting clients that otherwise would not go to those providers. Most of these providers work in areas where the TB/HIV epidemic has become very prevalent making the availability of TB treatment even more relevant. The commercial clinic companies as well as the private practitioners, therefore, have a financial incentive to have TB treatment available in their practice not only because that would keep the existing patients but also would attract more patients, such as family members of the existing patients. They would provide TB treatment as long as they are paid by someone to do it. Although the commercial companies mentioned improved accessibility as one of their motivations for getting involved in providing TB treatment, their main motivation remains purely financial. One of the private practitioners mentioned the importance of 'holistic care' approach that would potentially create a lot of job satisfaction for doctors: *"it is nice to see a patient and treat the patient until the very end"* (Private practitioner, Western Cape).

One of the factors that influence the degree of competition in a market is its contestability or the threat of other providers moving into the market (Harding and Preker 2003). The interviews found that this is particularly relevant for the private practitioners and commercial companies. Private practitioners mentioned that the growing number of the commercial clinic companies offering competitively priced services compared to those offered by private practitioners practices (discussed in chapter 5) are seen as their major competitors in the market. With a growing number of private practitioners the competition for a limited number of patients who either have private medical insurance or are willing to pay out-of-pocket for private health care is becoming a threat to private practitioners. Therefore, a large and growing private sector, and the competition that is creates, may be another motivation for them wanting to get involved in the provision of TB treatment (provided they are paid for it).

For the employer-based providers, the main financial incentive for partnership with the government is the cost saving that could be achieved through free drugs and access to use the public sector diagnostic facilities and equipment. They are either already providing TB treatment (as in the case with the mining company), in which case the drugs and access to the public sector resources would reduce their production costs significantly, or are finding it attractive to be able to provide the service to the employees and their dependants (as in the case of the textile company) through government subsidies. Other motivating factors mainly relate to the regulatory framework and political awareness. For the employer-based providers delivering primary health care in the textile company, the benefit of providing TB treatment is primarily of social and political nature, as they see political advantages in having a model of TB treatment delivery for low-income workers.

8.4 Conclusion

This chapter has explored the motivations for participation in existing public-private arrangements and incentive structures attributable to different partnerships for the provision of TB treatment in South Africa. The motivations of potential new private sector partners, focusing on apparent obstacles to provision of TB treatment in the private sector, were discussed. From the government's perspective, improving the quality of TB treatment, compliance and accessibility were the main motivations for participation in partnerships for the provision of TB treatment. Whilst the main motivation for the mining companies was profit maximisation by reducing the number of workdays lost due to TB, and improving their own TB programmes by following the national treatment guidelines, assisting the government in controlling the TB/HIV epidemic and financial support were the main reasons for the community-based NGOs to form a partnership with the Department of Health.

For potential private partners, the lack of access to diagnostic facilities and unavailability of drugs, poor communication between the public and private sectors, and inadequate knowledge of the national TB treatment guidelines are the apparent obstacles to provision of TB treatment. However, there is a considerable interest amongst the private providers who do not provide TB treatment to participate in partnerships with the government, provided they are given right incentives.

Incentive structures in the existing partnerships as well as those that may be needed for a well-functioning partnership are context specific and depend on the type of the provider, past experiences and regulatory framework. In the existing partnerships, incentives include both financial and non-financial incentives, and range from free drugs to training. Potential incentives that may be required to support development of broader PPPs in the provision of TB treatment include access to use the public sector diagnostic facilities/equipment and free anti-TB drugs, service agreement, and, in the case of private for-profit providers, a set fee per patient treated. In addition, training in the national TB treatment guidelines and a good working relationship with the government are found to be important.

In conclusion, private providers in the existing and potential partnerships appear to have both financial (cost-savings for the non-profit, and profit-maximising for the for-profit private providers) and non-financial motivations (training, good relationship with the government, access to use the public sector facilities) for participation in partnership for the provision of tuberculosis. However, although there must be sufficient (financial and non-financial) motivation for a partnership to be successful, the level of competition between private providers, regulatory framework, and social and political awareness become increasingly important. A range of incentives, therefore, could be used to encourage private sector participation in partnership with the government for the provision of TB treatment. While recognising that 'getting incentives right' is important in any principal-agent relationship, monitoring and evaluation of the partnerships, however, may not always be easy. As highlighted by the literature on incentives and contracting, other factors, such as levels of trust and perceptions of relative risks, may potentially play an essential role in underpinning efficient public-private relationships.

Chapter 9

DISCUSSION OF FINDINGS

9.1 Introduction

This thesis explored the feasibility of expanding TB treatment by enhancing partnerships between the private and public sectors in African settings. It examined two existing models of public-private partnerships, enabling it to highlight some of the practical strengths and weaknesses of different models of provision of TB treatment. Previous chapters have presented data on the quality of care and cost-effectiveness from three case studies of the provision of TB treatment - two public-private partnership models and a purely public model of treatment delivery - and incentive mechanisms attributable to different models of private sector participation in TB treatment. A literature review in chapter 2 gave rise to a framework which synthesised many potential factors for increased involvement of the private sector in the provision of TB treatment.

In line with some of the literature on the public-private mix in health care and the role of the private sector, the feasibility of increased public-private partnerships will depend upon the nature of the services itself as well as upon contextual circumstances. The three case studies highlighted different models of public-private provision of TB treatment for different study populations making it possible to consider what influences the performance of each model. This chapter considers the main limitations of the methodology the study used. Findings highlighted by a comparison between the models, and incentive mechanisms attributable to different models of public-private partnership, are then discussed.

9.2 Methodological and data issues

The study used a multiple case study approach. Case studies were able to examine different models of public-private partnership for the provision of TB treatment, using documentary sources, performance data and interviews to access both facts and perceptions about the public-private partnerships. They were able to deal both with more concrete factors such as quality of care and cost-effectiveness (which can be objectively compared), and other more subjective concepts such as motivation and incentives. However, attempting to compare the performance of a range of different models of provision also has limitations. They are as follows:

1. DOTS-based models of public-private partnership for the provision of TB treatment available for the study were limited. Two models of public-private provision were studied, together with purely public provision of TB treatment. Lifecare and SANTA models, described in detail in chapter 5, were excluded since they provide hospital-based TB treatment. Whilst contracts between the government and these two private providers have been used for many years to provide hospital-based tuberculosis care, the epidemic of TB associated with HIV is such that hospital-based TB treatment is no longer feasible (as discussed in chapter 6) and is not promoted by the WHO recommendations. Moreover, both the Lifecare and SANTA contracts have been subjected to scrutiny, and may not be a feasible policy option in the future. Finally, relative hospital efficiency of contracting out to Lifecare versus direct provision of hospital services has previously been assessed by Broomberg et al (1997). They evaluated hospital performance in terms of production costs and quality of various aspects of care for four tracer conditions (caesarean

section, normal delivery, appendectomy and hernia repair), but did not specifically assess the performance of the provision of TB services. Public-private models of provision of TB treatment with other private providers, such as traditional healers and private practitioners, are not available in South Africa, unlike in other settings such as India, Vietnam and Nepal. The study, however, included the existing models that are relevant to current policy options. In addition, the aim of the study was not to generalise widely but to explore and understand better the relationships between providers, influences on behaviour and performance in depth. Three models were chosen as three separate case studies to show differences in models.

2. There is a concern about the extent to which the models under study are truly comparable. In terms of workload, they are different, as the number of newly registered pulmonary TB patients varied from 50 to 423. This might have influenced the performance. However, non-randomised purposive sampling has been used to select sites that reflect different workload within each model of provision in order to do pair-wise comparison (i.e. between different sites in a same model). In addition, the model of the public-private partnership should depend on the type of patient and on the circumstances. For instance, the model that involves community-based NGOs is suitable for poor community members, old and unemployed people. On the other hand, the employer-based model is designed for low-income workers (such as miners) and for employed but without a comprehensive insurance. The study models are comparable in that they follow the same TB treatment protocol, are similar in terms of key social, economic and demographic characteristics, and provide care to the lower-income populations.

3. Non-randomised purposive sampling was used to identify sites that reflected communities and locations where PPPs are currently in place. Thus the sites varied significantly by TB incidence due to the nature of the PPP target groups. Although efforts were made to try and select sites with similar HIV prevalence rates, the nature of the PPP target groups and scarcity of data on HIV prevalence made this difficult. As there is a higher mortality rate associated with HIV status of TB patients, it was not possible to control for the fact that TB treatment outcomes might have been poorer in sites with a higher HIV prevalence rate than in sites with a lower HIV prevalence rate. This could have underestimated the cost-effectiveness at higher HIV/TB incidence sites. The PPPs were all relatively well functioning (with cure rates well above the South African average of 55%). The purposive sampling may have led to identification of better-functioning PPPs, which may suggest that results are optimistic.

4. The major caveat to using the study results in making policy recommendations is that it was based on a limited number of study sites (i.e. two sites in each model of delivery). There are three main reasons for such a small number of sites. First, a large amount of quantitative and qualitative data from document reviews, open-ended questions and semi-structured interviews needed to be collected, analysed and pulled together into a coherent story. This required a significant time effort. Second, it was sensible to select fewer sites and focus more on understanding better the relationships between providers and influences on their behaviour. Last, since there is a range of complex factors influencing evaluation results, a smaller number of sites allowed for a more thorough analysis. However, choosing such a small sample of sites should not have influenced losing any rigour.

5. The last major limitation relates to the valuation of patient time cost. While time spent making clinic visits does represent an important opportunity cost, whether this is lost productive time or lost leisure time, placing a monetary value on such time is difficult unless it can be unambiguously related to income losses. In these evaluations, the conventional practice of using average reported incomes among a sample of patients is used to value time (Gold et al 1996). This may under or over-estimate true costs. Nevertheless, the results suggesting that patient costs were reduced with the public-private models of delivery can be argued to be robust for three reasons. First, they hold in sensitivity analyses accounting for the variability in the survey data collected. Second, even if time costs were valued as zero, the results hold. Lastly, it seems likely that in the public-private non-profit model patients chose an option that would minimize the costs associated with their treatment, and this is the assumption underlying the analysis.

Both quantitative and qualitative methods were employed in the research. The qualitative approach adopted had both strengths and weaknesses. Strengths were its ability to accommodate the variety of factors that needed to be considered. Weaknesses mainly include the reliance on interview data which raises the question of the influence of the interviewer's own role in the research process and how it is likely to have affected the study's findings.

In some cases it was possible to triangulate findings methodologically by drawing on data on performance or cross-checking perceptions with facts, and where this was so it has been carried out. For instance, checks could be made of need to employ extra assistants to deal with all the reporting requirements of the partnership versus whether assistants had ever been employed, but there are many examples where such triangulation was not possible e.g. in response to questions about more subjective issues such as motivation. Because there was not an opportunity to observe the day to day interaction between private and public providers over a long period of time, an account of the nature of the relationship had to a large extent rely on what was said about it by those involved.

Transcribed questionnaires were sent out to all the respondents who were asked to comment on the way the data collected through the interviews were transcribed and interpreted. Around half of the respondents replied, some with minor suggestions on several issues. Triangulation of analysis, however, was not carried out partly for logistical reasons and partly due to questions about the usefulness of triangulation in this type of study (Silverman, 1993; Seale, 1999). The way in which the interview data were analysed and written up must be acknowledged to be a single unique commentary on the phenomenon under investigation and the analysis of a second researcher was likely to produce a second unique commentary. How these two competing narratives would then be reconciled may have been problematic.

In conclusion, the reliance on both quantitative and qualitative methods strengthens the study as the two approaches complement one another. As Coast (1999) summarises: *"the strengths of qualitative research is its ability to aid understanding, provide explanations and explore issues, particularly those of a complex nature. Its weakness, in comparison to quantitative research, is that it does not provide empirical data which are statistically generalisable to whole populations"*.

9.3 Discussion of findings

The review of theoretical and empirical literature has provided a framework for assessing the potential for increased involvement of the private sector in TB treatment. The review has shown that there are two, often implicit, main alternative rationales for the role of the public sector: to provide 'insurance' where insurance markets fail, and to finance and ensure provision of an essential cost-effective package of services. These two rationales imply very different roles for the government, the first suggesting it should protect the population from catastrophic costs; the second that it should limit itself to primary and selective hospital care. Governments in poorly resourced countries cannot do both adequately. The background and context of the public-private mix in South Africa provided in chapter 3 suggest that the public sector cannot effectively control TB epidemic without drawing on the private sector. South Africa's public sector is faced with legacy of fragmented services, inequity and a weak human resource. The private sector, on the other hand, is large, employing the majority of personnel and other health resources. This, combined with the TB/HIV epidemic, leads the public sector to depend on the stronger private sector to meet increased demand for TB and HIV related services.

In order to ensure access to poor people who are the most seriously affected, diagnosis and treatment for TB treatment in South Africa is provided free of charge in the public sector. However, the government is not the only provider of TB treatment. There are three groups of private providers which are involved in the provision of TB treatment in South Africa: the private for-profit group, through contractor hospitals, private practitioners and private hospitals; employer-based health care providers; and, the non-profit private sector. The provincial TB control programmes have partnerships for directly observed TB treatment with providers from all the groups. This study has evaluated the performance of two models of public-private partnership, and compared it with the pure public provision of TB treatment. The findings of the performance evaluation, in terms of quality of care and cost-effectiveness, are discussed below.

9.3.1 Performance of each model

Public-private for-profit partnership model

In terms of structural quality, the public-private for-profit model of delivery of TB treatment scored higher than the public sector model of delivery in all categories except 'patient environment'. The mining companies have very good resources which impact on the technical quality of care. A lack of health education material on display or available to take home as well as a clear system for patient complaints/suggestions mechanism contributed to a slightly lower score in the category. In terms of process quality, the public-private for-profit and public models of delivery achieved almost the same score, reflecting a very good knowledge of the treatment guidelines for both private and public sector health care providers. As far as the outcome quality of care is concerned, the public-private for profit model scored higher than the purely public sector. However, it must be acknowledged that the outcome quality is difficult to measure as there may be other factors that affect TB treatment outcome, and compliance to treatment is only one of them.

The relatively good quality of care had an effect on the compliance rate (on average 87% successful treatment completion rate) and cost-effectiveness ratios. Although the average cost per patient treated in this model of delivery was the highest when compared to other models, the relatively high compliance rate improved the cost-effectiveness of TB treatment. One of the reasons for such a good compliance is the system of 'parading' which is in place in the mining companies where the patient has no choice but to adhere to the treatment (described in chapter 6). The ethical side of this system is, however, doubtful. Whilst the successful treatment completion rates in the mining companies are high (mainly due to the system of 'parading'), the cure rates are much lower when compared with other models. This was influenced by the relatively higher HIV incidence amongst TB patients, and the relatively higher number of HIV-related deaths amongst TB patients, in the mining community. Consequently, when the effectiveness is measured using the cure rate, the cost-effectiveness worsened. From the patient's perspective, the model is the most cost-effective of all the study models, because there are no patient costs associated with TB treatment.

Public-private non-profit partnership model

In terms of quality of care overall, the public-private non-profit model of delivery of TB treatment scored higher than the purely public model for the following reasons: better accessibility, patient's adherence to treatment, management and staffing, and active defaulter tracing in place. Involvement of NGOs in the provision of TB treatment is of a vital importance as they have an active role in health promotion in the community and many patients seek treatment from/through them. By providing directly observed TB treatment close to where patients live, the costs of seeking care such as travel costs are significantly reduced. This study confirms that involving NGOs in the provision of TB treatment can improve access to direct observation of treatment and improve treatment success rate over 80%, as shown is previous studies in India and the Philippines (Rangan et al., 2003; Mantala 2003).

Another important area where NGOs play a significant role is retrieval of defaulters. To perform this function, close coordination with local national TB control programme staff, through the general medical services, is essential. In a review of the DOT experience, Volmink et al (2000) acknowledge that reminder letters to clinic defaulters, assistance of patients by lay health workers, monetary incentives, and increased supervision of staff all contribute to higher treatment completion rate. NGOs can play a role in formulating, developing and revising information, education and communication materials that are appropriate for the local context. These factors have a major influence on treatment compliance which was reflected in cost-effectiveness. This model of the provision of TB treatment is the most cost-effective from the perspective of the society. Previous economic studies have shown a reduction in costs and improvement in cost-effectiveness of DOTS through decentralisation and strengthened community-based care (Islam et al., 2002; Floyd et al., 2003; Moalosi et al., 2003; Nganda et al., 2003; Okello et al., 2003; Sinanovic et al., 2003). Costs associated with community-based DOT were 40-50% lower than public health facility treatment, and cost-effectiveness of community-based DOT was approximately 50% higher. This study confirms that community-based approaches to the directly observed treatment of TB can be cost-effective in various African settings.

Purely public sector model

This model of the provision of TB treatment achieved the lowest overall quality of care indicator. Why is quality of TB treatment so much lower in the purely public sector than in the public-private partnerships? Three explanations can be proposed. First, government objectives may be primarily focused on access, which means that the number of people who gained access to care is more pressing than quality. Second, resources available and quality of care are often linked. The poor quality of TB treatment in the purely public sector could be connected to the lack of resources (e.g. human resources, amenities, and convenience). The third is the institutional framework within which the government operates, which makes it structurally unresponsive to patient demand and preferences. In this context, budgets are set historically without reference to TB patient loads.

In terms of cost-effectiveness, the purely public model was the second most cost-effective model from the provider's perspective and the least cost-effective from the patient's perspective. The study findings are in line with other studies that evaluated cost-effectiveness of TB treatment from a patient's perspective (Saunderson 1995; Floyd et al., 1997; Sinanovic at al., 2003), demonstrating that cost to the patient is the highest in ambulatory settings. The availability of the treatment at a workplace and in the community resulted in substantial savings to the patient. There were no patient costs associated with the treatment in the public-private for-profit partnerships, and the cost to the patient supervised in the community was substantially lower than in public sector facilities.

The theoretical and empirical literature highlighted that the primary economic rationale for introducing or expanding the role of the private sector in the health system, in instances where the public sector provides most health care, is the promotion of allocative and technical efficiency. The public-private models of the provision of TB treatment evaluated in this study appear to be an attractive economic option for both providers of health services and patients. They improve affordability and cost-effectiveness of care compared with the purely public model of service delivery, and the quality of care that has been achieved is higher.

9.3.2 Public sector financing

The literature review in chapter 2 argued that greater attention needs to be paid to establishing and improving relationships between the public sector and private providers. As discussed in chapter 3, the South Africa's health sector objectives of PPPs for the provision of services are improved access and quality of care, improved service delivery in areas of need, and promotion of public health role of private practitioners. South Africa has a long history of public-private partnerships within the health system. This includes the contracts with both profit and non-profit providers supporting the provision of tuberculosis (e.g. Lifecare, SANTA), psychiatric and secondary level hospital care for public patients. However, despite South Africa's high total health care spending (8.5% of GDP), its health status ranks poorly with respect to countries spending as much or even less on health care (McIntyre et al, 1995; McIntyre and Gilson, 2002). This study has shed light on how the public and private sectors can work together more effectively (in the provision of TB treatment) in order to improve overall health systems performance. Maximising the use of existing resources through PPPs, and avoiding duplication of resources, could potentially improve efficiency in the public sector and lower the costs of private provision of TB treatment. Moreover, better quality of TB care in the public sector could be achieved by improving access to treatment, reducing the time spent waiting for and receiving care, and improving success rate through the use of the private sector infrastructure, human resources and expertise. It must be acknowledged, however, that public sector resources are constrained and further private sector market expansion limited adding to the pressure to increase the levels of interaction between the sectors.

The relationship between the public and private sectors with respect to service delivery is traditionally viewed by health economists in terms of two key functions, that of financing and provision (Donaldson and Gerard, 1993; Bennett et al, 1997), by which the responsibilities of the public and private sectors are delineated. A traditional view is that TB control is a public health concern for which the state has a prime responsibility (World Bank, 1993; Jack, 2001). Another view is that the priority public sector role is to provide insurance where insurance markets fail (i.e. to protect the population from high health care costs), and that the private sector should dominate in primary care (Hammer and Berman, 1995). Furthermore, the ongoing health sector reform in developing countries is characterised by increasing private provision and financing of health care services. In order to capture the full complexity of relationships between the public and private sectors in PPPs, which involves the overlapping and sharing of functions with respect of financing and provision, this study has found that there may be relationships in which the financing function cannot be solely attributable to one or the other sector. The private sector (i.e. mining companies and NGOs) may raise capital financing to meet infrastructure requirements, whilst the public sector provides support through subsidies, drugs and training. The boundaries that exist between both financing and provision by the public and private sector are, therefore, blurred. PPPs for the provision of TB treatment capture the overlapping of functions with respect to both financing and provision, whilst unpacking the complex nature of shared functions.

In terms of financing of the PPPs, the public sector finances a small fraction of the service provision cost in the public-private for-profit model (either through the provision of free anti-TB drugs or reimbursement per patient day). From the public sector perspective it is the least costly model of partnership to finance, as most of the resources employed in these partnerships are those of the private provider. As far as the public-private non-profit model is concerned, the public sector finances around half of the NGO's service provision cost (through subsidies). However, this model is almost twice as cost-effective as the purely public sector model.

New institutional economics assumes that high transaction costs is one more reason for a dominant government role in provision. Williamson (1985) argued that the appropriate institutional form for producing and delivering goods and services depends on which form minimises costs. Transaction costs are incurred because of the risks involved in exchange: each party concerned has limited information about how their partner will behave and whether future circumstance will change. Transaction costs involve the costs of establishing partnerships, of acquiring necessary information, and of monitoring. The costs of partnerships identified by respondents included setting up information systems, staff training and transport. No attempt was made in this study to quantify these costs. There are a number of reasons for this. First, transaction costs are difficult to measure numerically and are much more frequently described by comparative algebra rather than enumeration (e.g. 'greater than' or 'less than'). Second, it is often difficult to differentiate the extra transactions costs associated with partnerships from the costs of production. For instance, some of the information collected for the purposes of monitoring partnerships may also be used for management purposes. Third, a more detained specification of the service that needs to be provided and a more formal way of formalising interaction between public-private partners both increase transaction costs. Fourth, some transaction costs, such as setting up of information system, may reduce over time. As more information becomes available, the degree of uncertainty reduces, which can also decrease transaction costs. Finally, transaction costs could be reduced if public and private partners develop more trusting relationships and negotiate more flexible and longer-term contracts (Ashton, 1998).

The highest transaction cost reported by the private sector partner was staff time spent on reporting to the public sector partner. Often extra assistants had to be employed to fulfil all the administration requirements of the partnerships. To some extent, the cost of additional staff time required for reporting has already been included in the cost of service provision. However, these costs were small comparative to the cost-savings private partners achieved through partnerships. On the public sector side, no additional staff had to be employed to cope with the extra work. This does not mean that there were no transaction costs associated with setting up partnerships. It must be stressed that, the more that the public sector partner (i.e. provincial TB Control Programmes) controls private partners and shifts risk to them, the higher transaction costs and less the interest in enhancing partnerships between the private and public sector for the provision of TB treatment. On the other hand, an informal partnership based on a long-term relationship is likely to reduce incentive for efficiency. However, if the nature of the service provided through the partnership is such that specifying and monitoring performance is easy, than the argument for a closer relationship of co-operation between the private and public partners is greater (Mills et al., 2001).

9.3.3 Motivations and incentive mechanisms for each model

Economic theory suggests that problems are likely to arise in any principal-agent relationship as the agent is tempted to pursue his/her own goals at the expense of those of the principal. Though the problems of principal-agent relationship are unavoidable in health care, creating appropriate incentives for agents and monitoring and sanctioning of agent behaviour are some of the ways for solving the market failure (Mills et al., 2001). How different providers in the health care system are paid can have an impact on their behaviour, and therefore on the achievement of the objectives of the health system. The transition from public to public-private sector treatment of TB raises a range of issues related to motivations, incentives and structuring relationships to achieve desirable outcomes. The study findings suggest that private providers in the *existing* PPPs have both financial, as predicted by the theory, and non-financial motivations for participation in partnership for the provision of TB treatment. The examination of the motivations highlighted that whilst the main mechanisms for both models of the existing public-private partnership appear to be a combination of financial and non-financial incentives, the private non-profit providers are more influenced by financial incentives. One of the explanations for this could be the fact that the mining companies have a strong motivation to keep their workforce healthy, in a partnership with the public sector or on their own. As discussed in chapter 5, the South African mining industry employs just under 400 000 people, mainly migrant workers from rural South Africa or neighbouring countries. Tuberculosis incidence rates among silica-exposed gold miners are over 3 000 per 100 000 employees, almost 10 times higher than those among the general population. It was estimated that up to 30% of mineworkers in certain mines are HIV positive. The combination of TB as an increasing occupational hazard for miners and the HIV epidemic has made mining companies realise that they must implement workplace TB and HIV control programmes to manage the disease, and accept responsibility for the consequences of unsafe working and living conditions in South African mines. The structurally crucial role of mining in the South African economy should be noted, despite understandable concerns with the generalisability of the results outside the mining industry. Existing models of PPPs available for study in other sectors were limited.

In addition to their more altruistic motivations, the community-based NGOs (the private non-profit provider in the partnership), on the other hand, appear to be financially dependent on the government funding. Motivations for PPPs of the government appear to be similar to those of the private providers, with improving TB programmes through better compliance and increased accessibility to treatment being the main motivations for participation in the PPPs.

Swan and Zwi (1997) suggest two possible mechanisms for increasing the delivery of publicly financed, privately provided services: (a) the provision of financial incentives (fee for services, target payments) fully remunerating private providers for delivery of a service; and, (b) contracting out. This study has found that *potential* private providers have no incentive to provide TB treatment. However, if certain incentive mechanisms are in place then partnerships with the public sector is a way for them to provide TB treatment. The study has found that incentive mechanisms necessary for potential partners' participation are as follows:

1. Free provision of drugs;
2. Free access to use the public sector diagnostic facilities and equipment;
3. Free or subsidised provision of continuing education for private practitioners;
4. Government financing of certain privately provided services;
5. Committees to facilitate public and private sector co-operation; and,
6. Lump sum annual subsidies.

The experience with the use of incentives in the UK as a means of increasing the emphasis on prevention and health promotion in general practice shows that designing an incentive scheme that will achieve given objectives is far from easy. As Iliffe and Munro (1993) comment: *"incentives probably influence the activity of some general practitioners all the time and all general practitioners some of the time. But no incentive package yet offered influences all general practitioners all the time"*. Others argue that incentives may have had adverse effects (Hannay et al., 1992; Hughes and Yule, 1992; Iliffe and Munro, 1993). While in all cases remuneration has to be set at a level sufficient to compensate the doctor for the cost of provision, an ideal incentive system would be individualised as every person has a slightly different set of responses and motives (Hughes and Yule, 1992).

It must be highlighted that such context- and provider- specific incentives would, however, require a high level of information and monitoring capacity. Moreover, it has been argued that once private for-profit providers such as private practitioners reach a target income the effectiveness of financial incentives is likely to decline. Effectiveness is likely to be greatest, therefore, where private providers are under-utilised (Swan and Zwi, 1997). Public funding could be used to reimburse partially or fully private providers for the provision of either specific TB services particularly poorly covered by the public sector in the provider's area (e.g. TB defaulter retrieval) or a complete range of TB services to a defined population (e.g. TB treatment at the workplace). By encouraging the provision of service at no charge, this approach might facilitate increased coverage in areas of particular need where ability/willingness to pay is limited.

Both private providers and government officials interviewed in this study mentioned a contract as an incentive needed for a well-functioning partnership. Principal-agent theory indicates that incentives are key to the appropriate design of contracts, but due to the asymmetries of information their operation may be problematic. How appropriate are contracts in developing country context? Mills (1997) maintains that contracting out cannot substitute for good public sector management. Contracts are tools which have to be managed, and in certain respects this may be more demanding on managers than direct provision, requiring new skills. Contracting out is also not seen to be a solution to very limited budgets: if governments cannot afford to fund direct provision adequately, it is highly unlikely that they will be able to adequately fund contracts. In fact, contracts may simply protect an arbitrary selection of services from cuts. Lastly, it should be recognised that some of the circumstances that may make public sector provision inferior to contracted out services could change. For instance, paying staff above the market rate or borrowing funds to finance investments would make direct provision more attractive.

The major difficulty with devising an incentive compatible contract in the agency relationship is that of measuring performance, as health outcomes are problematic to measure and may not be directly attributable to performance of the individual health care provider, but rather to their team or to other determinants of health status. Rewards or reimbursement mechanisms could relate to observable tasks and characteristics (Forsberg et al, 2001; McPake et al., 2002). In this case, there is an incentive for regulated firms and individuals to neglect other tasks and characteristics. It may also be difficult to measure the behavioural response to changes in payment systems. For example, in Uganda, the switch from reimbursing hospitals on the basis of bed numbers to bed occupancy resulted in longer lengths of stay (Ssengooba et al., 2000). Unless there is effective monitoring of contracts, the contractor has the incentive to manage production in such a way as to skew observed characteristics to meet the target. The challenge for contracts designers, therefore, is to decide whether it is better to *"rely on incentives related to tasks and characteristics which are observed with more certainty, but with less impact on performance, and those tasks and characteristics which are observed with less certainty but are more likely to impact behaviour"* (McPake et al., 2002). Finally, since health outcome is not easily observable by third party payers, contract reimbursement is almost never linked to health outcome. Although it is desirable that contracts have such incentives, it is rarely the case, mainly because health outcome is not primarily dependent on health service inputs (McPake et al., 2002).

However, this study has found that measuring performance of the public-private for-profit partnerships with the mining companies appears to be quite simple mainly because the mining companies have a very strong financial incentive to provide a good quality TB treatment to their employees. It is in the profit-nature of their business to keep their workforce healthy. The monitoring of this partnership involves reporting registered TB cases and their treatment outcomes on a quarterly basis, and notifying the local authority of the incidence of TB and TB-related deaths on a weekly basis. The provincial TB programme manager also visits the private provider several times a year. It should be stressed, however, that this approach to monitoring of partnerships with for-profit providers such as private practitioner and commercial private clinics may not be ideal as these providers have different motivations for participating in partnerships with the public sector. As discussed in chapter 5, management and monitoring of the contract with Lifecare was seen as a problem. This was partly because the contract specification was weak, making monitoring difficult, and partly because information on which to monitor was lacking. Moreover, the payment arrangement involved per diem method which might have provided Lifecare with an perverse incentive to prolong length of stay in its hospitals. This points to capacity weaknesses in provincial departments of health and highlights the importance of government capacity to design and monitor such contracts.

Whilst monitoring the mining companies appears to be straightforward (as they have an incentive to provide a good quality treatment to their workers), the main challenge for the government is how to measure the performance of partnerships with the NGOs. In the absence of a set of clear guidelines on how to monitor and measure performance of the NGOs, the government relies on measuring their performance through monthly financial statements and quarterly reporting of cases supervised in the community. It has been recognised that it would be difficult to measure NGO's performance using treatment outcomes mainly because poor treatment outcomes could be due to other reasons that are beyond the disease. At this stage, there is no method whereby the NGO's contribution to community-based TB treatment (which includes more that just directly-observed TB treatment) can be linked to outcome. In addition, NGOs are responsible for the supervision of a relatively small number of TB patients that makes it even more difficult to make any judgements about the outcomes. This study has found that building good relationships based on trust, between public providers and the NGOs is almost as important as measuring the performance (or could be a good substitute to performance measuring). As one of the government officials explained:

we've got a common role that we are aiming to achieve. Does it make a difference to try and split and measure each separate? I think it is a question that will be answered as we go along" (Government official, Western Cape)

In addition, the capacity of the government to design an adequate tool for measuring performance is lacking.

"being a one-man show, it is very difficult and we are not doing efficient monitoring. We should be going out far more often to look at what they are doing, to do audits for what they are receiving money, and to see whether they are actually doing what they say they are doing. But it is very much a capacity issue" (Government official, Western Cape)

As shown in the literature review, the concept of trust is increasingly seen as playing an essential role in underpinning efficient public-private interactions (Deakin and Wilkinson 1995; Goddard and Mannion 1998; Gilson, 2003). This study has found that the level of trust could potentially play an important role in public-private partnerships, particularly when efficient monitoring and performance evaluation is difficult to achieve. That would, however, largely depend on factors such the type of the provider, regulatory environment, past experiences, and the nature of each relationship.

Finally, the various forms of incentive management have different implications for risk distribution that have efficiency implications. For instance, if a payer organisation faces significant risk associated with the reimbursement mechanisms, it may respond by conserving inefficient levels of reserve to ensure that crises are avoided under all possible scenarios. If a provider organisation faces high levels of risk it may also devise inefficient measures to protect itself. The ideal for a public-private partnership is contractual arrangements that create sufficient risk transfer in a competitive environment and thus maximises efficiency without resorting to a regulatory set-up. The partnership with the mining companies is taking place within the regulatory environment in which the mining companies are obliged to provide TB treatment to their employees. Regardless of whether the government provides them with the free drugs/reimbursement or not they will continue to provide the treatment. Although they have to comply with the national TB treatment guidelines and time-consuming reporting requirements, they perceive no risk involved in the partnership with the government. The only risk would be on the government side where, in a case that the law changes, the mining companies decide to pull out of the entire process. In that case it is the patient who would bear the risk, as the mining companies are not financially dependent on the government funding.

Partnership with an NGO is more risky than with a mining company because the NGO may be almost entirely dependent on the financial subsidy from the government, and it does not have the same incentives as the mining companies. In addition, due to the nature of the monitoring system it is difficult to justify whether the funding provided to the NGOs is a good use of public money. The past experiences with a national NGO SANTA have made the government aware of potential irregularities in the reporting system and problems with mismanagement and misuse of funds. At the same time, the partnership with the government poses a high risk to NGOs in terms of funding. Since the service agreement that they have with the government is renewable every year, and taking into considerations the far-from-ideal monitoring mechanism, their major concern is that the financial subsidy could be easily terminated. It is important to stress, however that having to review their service agreements annually creates incentives for the NGOs to be efficient and competitive.

9.4 Conclusion

This chapter has discussed the findings from the three different models of provision of TB treatment evaluated by this study, as well as some of the major limitations of the methodology and data used. The two models of public-private partnerships provide superior quality of care and more cost-effective treatment for TB than the purely public model. This means that the cost per patient treated to the public sector could be reduced, and quality of care improved, by enhanced partnership between the private and public sectors. Private providers in existing and potential partnerships have both financial and non-financial motivations for collaborating. Therefore, a range of incentives, both financial and non-financial, could be devised to encourage private sector participation in the provision of TB treatment. Despite some limitations and issues around generalisability of the findings, this study has generated new evidence on the nature of TB treatment delivery in South Africa including models of PPP and the performance of PPPs. There was a particular focus on quality of care and cost-effectiveness, and the incentive mechanisms for private sector participation in PPPs.

Chapter 10

CONCLUSIONS AND RECOMMENDATIONS

10.1 Introduction

The study aimed to redress the lack of empirical data on the performance of private providers in developing countries by evaluating different models of public-private partnerships in the provision of tuberculosis. Chapters 5-8 addressed the first four objectives of the study by providing a comprehensive overview of the nature of the provision of TB treatment; presenting the findings of the performance of different public-private partnership models in the provision of TB treatment; and, outlining incentive mechanisms for private sector participation under different partnership forms in South Africa. This chapter starts by presenting a systematic summary of the methods used for the study objectives. Using the conceptual framework, developed by drawing on a review of literature relating to public-private mix, incentives and tuberculosis treatment, and employed throughout the study, conclusions are made, generalisability of the study findings discussed, and the study contribution to knowledge outlined. The chapter then addresses the final objective of the study by making recommendations on how policy-makers in South Africa and elsewhere could best approach a policy on the enhanced role of the private sector providers in TB treatment, and what is likely to be appropriate for different models of public-private partnership. Finally, suggestions for future research in this area are made.

10.2 Summary of the methods used

This thesis has addressed the first four study objectives in the following ways. Using document review and interviews with key informants, chapter 5 provided an overview of the National TB Control Programme and the nature of TB treatment delivery in the public sector. A review of private sector provision, including private for-profit and private non-profit providers was given. The review included characteristics of providers, organisation of TB service delivery, roles and responsibilities to TB treatment, and cost and utilisation of TB treatment. Background and context for the structure of the public-private mix, and the TB/HIV background, were also provided. Chapter 5 also described different arrangements between public and private providers of TB treatment in South Africa. Partnerships with the non-profit sector (non-governmental organisations); the mining companies and other employer-based occupational health services; and, the for-profit sector (private practitioners and traditional healers) were discussed. What form the partnerships take and who is responsible for monitoring them was also described.

Employing quantitative methods, chapters 6 and 7 presented the performance of two different models of provider partnerships for different study populations: public-private for-profit (employer-based) and public-private non-profit (non-governmental organisations). These models were compared with purely public provision of TB treatment. The quality of care was evaluated in terms of structure, process and outcome (chapter 6). The cost-effectiveness of TB treatment was estimated for each model of delivery (chapter 7). The evaluation was retrospectively undertaken from a provider perspective (the costs of providing TB treatment borne by the organisation delivering the services and the Provincial TB Programmes) and a societal perspective (including patient's travel and time cost). The financing required for the different models from the perspective of the Provincial TB Programme, provider, and the patient were also estimated.

Chapter 8 explored motivations for partnerships and incentive structures in existing and potential future partnerships. Qualitative data on the motivation for participation in existing public-private partnerships, and incentive mechanisms necessary for private participation in TB treatment were generated through semi-structured interviews. Potential private partners, their obstacles to providing TB treatment, and the incentive structure that may be needed for a well-functioning partnership are identified.

10.3 Thesis conclusions

This research therefore can conclude the following:

The nature of TB treatment delivery including models of PPPs

A rapid increase in the detection of TB in a high HIV/AIDS environment and the emergence of MDR-TB has led the South African government to identify TB as one of the national health priorities. Whilst there is a good commitment at all levels of government to the TB Control Programme, the main constraint to effective TB control in South Africa are managerial and organisational weaknesses at the district level. In addition, the DOTS strategy is not completely implemented with the results that patients are not adequately treated which contributes to high interruption rates and a rapidly-growing MDR-TB epidemic. Diagnosis and treatment for TB is provided free of charge in the public sector, ensuring access to poor people who are the most seriously affected. Whilst the public health sector is predominant in the provision of TB treatment across the country, it is not the only provider of TB treatment. Private sector providers who provide TB treatment could be classified into three major groups: (1) the private for-profit health sector which includes contractor hospitals, private practitioners and private hospitals; (2) employer-based health care providers; and (3) the non-profit private sector, represented by the NGOs. Public-private partnerships remain a relatively new phenomenon in South Africa, and are seen as one component of the public sector's overall strategy for the provision of public services. Different public-private arrangements for the provision of TB treatment exist in South Africa. They range from formal contracts with the for- and non-profit hospitals to informal, historical partnerships with the employer-based service providers to formal/informal arrangements with the NGOs. Small-scale partnerships with private practitioners/hospitals and traditional healers are emerging. However, models of provision with these private providers were not available for study in South Africa. Most of the existing PPPs are public-employer-based service providers in the mining sector and public-NGOs.

Quality of care for the treatment of TB

The quality of care is superior in both models of public-private partnerships selected for the study when compared to the purely public sector model of delivery, and therefore shows that, in light of the TB/HIV epidemic, increased collaboration with private providers through partnerships could potentially improve the quality of care and increase access to care. There are many factors that influence different quality of care between the models. The mining companies provide TB treatment to their employees within a very well resourced private health system in which the employees have a strong economic rationale to complete the treatment. In addition, the mining companies are bound by law to provide TB treatment to their employees. The NGOs, on the other hand, have a strong ideology of care and support. They develop alternative strategies for community-based TB treatment and make the treatment accessible to poorer community members. Lastly, the relatively poor quality of TB treatment in the purely public model of delivery could be directly linked to insufficient funding, poor working conditions for doctors and nurses, and the flight of skills to the private sector or overseas.

Cost-effectiveness of TB treatment

The results of the cost-effectiveness show that, in comparison with the purely public provision, the public-private partnership models could significantly reduce costs to both the public health sector and patient, and increase cost-effectiveness of TB treatment relative to expansion of purely public services. In addition, TB treatment provided through the public-private partnerships seems to be more accessible and convenient for patients in both study populations (i.e. employees and poorer community members). From the *provider's* perspective, the study results show that the most cost-effective TB treatment is in the public-private non-profit model reflecting both lower cost per patient treated and relatively higher treatment completion and cure rates. The least cost-effective was the public-private for-profit model. From the *patient's* perspective, the most cost-effective TB treatment was in the public-private for-profit model, and the least cost-effective was the purely public model. Finally, from the perspective of the *society*, the public-private non-profit model of delivery of TB treatment remained the most-effective model of all the models of delivery. Cost-effectiveness data presented here suggest the cost per patient treated to the public sector could be reduced by enhanced partnership between the private and public sectors.

Motivations of different partners and incentive structures for well-functioning partnerships

Private providers in the existing and potential partnerships have both financial and non-financial motivations for participation in partnership for the provision of tuberculosis. The main financial motivations for the for-profit and non-profit are profit-maximising and cost-savings respectively. Training, controlling TB epidemic, and good relationship with the government are the main non-financial motivations for participation in partnership for the provision of TB. Whilst incentives in the existing partnerships range from free drugs to training, incentives that may be required to support development of broader PPPs in the provision of TB treatment include access to use the public sector diagnostic facilities and drugs, and in the case of private for-profit providers, a set fee per patient treated. Training in the national TB treatment guidelines and a good working relationship with the government are also found to be important. A range of incentives, therefore, could be used to encourage private sector participation in partnership with the government for the provision of TB treatment. While recognising that 'getting incentives right' is important in any principal - agent relationship, monitoring and evaluation of the partnerships, however, may not always be easy and other factors, such as levels of trust and perceptions of relative risks, may potentially play an essential role in underpinning efficient public-private relationships. It must be acknowledged that incentive structures in the existing partnerships as well as those that may be needed for a well-functioning partnership are context specific and depend on the type of the provider, past experiences and regulatory framework.

Overall, these public-private partnerships show that there is a strong economic case for expanding the private sector (i.e. workplace and community) involvement in TB treatment in the process of scaling up. The cost per new patient treated to government could be reduced by enhanced partnership between the private and public sectors. Expansion of PPPs may require increased investment in the public-private partnerships, but they seem to be capable of delivering important improvements in the affordability and efficiency of TB treatment, and improving the South African health system's capacity to cope with the impact of the HIV/AIDS epidemic.

10.4 Generalisability of results

The importance of the findings depends on the extent to which they can be generalised. In terms of quality of care and treatment effectiveness, there may be certain key inputs that explain the comparative success of public-private partnerships. First, there is strong management capacity and important resources have been devoted to this. For example, the mining sector has good resources and this has direct impact on the technical quality of care. Second, motivation to achieve high cure rates (or at least high successful treatment completion rates) exists on both sides – that of a patient - worker (because of the parading and job security) and that of the employer (productivity). This may not exist in the public sector context and may not be the case with other companies. Third, the NGOs responsible for the overall management of community-based care work in close partnership (with a service agreement in place) with general health services, and are accountable to them. Fourth, government health services have supported the partnerships with the private providers. These factors may be required if the performance of these partnerships are to be replicated elsewhere in South Africa. In terms of costs, the fact that DOT visits were the most important cost driver means that results will hold if purely public clinic DOT visits are as or more costly than they are in the partnerships. All these factors have been discussed in greater detail in chapter 9.

It is also important to consider where the employer-based and community-based approaches are of greatest relevance. Arguably, the employer-based TB treatment is most appropriate in companies which employ a large number of people, where occupational health clinics exist and where TB is an occupational health problem, as it is in the mining industry. It may not be generalisable to industries where TB is not an occupational disease and which do not employ a large number of people, although large companies like Eskom and Mercedes Benz have started projects which involve workplace-based DOT. In the case of the community-based TB treatment, it is most appropriate in areas where public sector clinics are already working at capacity; where clinic-based care is not achieving high cure rates; where geographical access to health facilities for patients is poor; and where more affordable but still cost-effective approaches are required due to health service budget cuts and/or increases in the number of TB cases. The different ways in which community-based TB treatment can be implemented depend on the level of socio-economic development, the degree of social mobilisation for TB among other health activities, and the particular cultural setting (Maher et al 1999). While the principles of community contribution of TB are generalisable (e.g. close links between the general health services, TB control programme and community-based NGOs), the details of how this model of service delivery is designed and implemented will depend largely on the specific setting.

Potential difficulties with more widespread implementation of the models of PPP implemented in the provinces of Free State, North West and Western Cape need to be acknowledged. Policy-makers may be unconvinced that subsidising mining companies' health services for providing TB treatment to their employees, and payment of financial incentives to lay people for involvement in community-based TB treatment, is a suitable use of government funds. However, the study analysis indicates that, even if the government subsidised the mining sector medical services and funded community-based TB treatment directly, it would still reduce costs and improve quality of care compared to the purely public sector. The provincial government of the Western Cape has already signed service agreements with NGOs.

Finally, although this study was designed to evaluate public-private partnerships in South Africa, it can address questions of importance to a number of other African countries. Whilst the context of tuberculosis treatment provision in South Africa is specific, there are many other countries that experience the TB/HIV epidemic, and have a variety of private providers who may potentially get involved in the provision of TB treatment. However, a key difference between South Africa and other countries in Africa is the availability of formally trained and registered private health care providers. Whilst the majority of private health care providers in South Africa are formally registered providers, in many other African countries private health care providers are often unregistered and untrained. In addition, whilst there are many private for-profit providers in South Africa, non-profit private providers such as NGOs and church related facilities dominate in other countries.

10.5 Thesis contribution

There are several ways in which this study contributes towards addressing some of the key research gaps and unanswered questions concerning private sector involvement in the provision of TB treatment and public-private mix identified in chapter 2. First, this study offers a set of data about the nature of TB treatment provision in South Africa, focusing on the characteristics of different service providers, the extent of their involvement in TB treatment, and the interaction between public and private providers. The four main providers of TB treatment: the NTCP operated by and through public health services at district level; employers, such as mining companies which provide TB treatment either in-house or contract out to managed health care companies; contracted out private-for-profit hospitals; and, non-governmental organisations providing community-based TB treatment.

Second, the study documents practical efforts involving the private sector by reviewing models of partnerships between public and private providers of TB treatment. Models of public-private partnership in health are scarce, especially in developing countries. The study shows that whilst the public health sector is predominant in the provision of TB treatment across the country, experiments involving private providers are considerable and growing. The study provides data on public-private partnerships at a national level.

Third, the study provides information on the performance of the existing models of public-private partnership in terms of quality of care and cost-effectiveness, on their own and compared with that of the purely public sector. The data in this thesis do not shed light on the nature and performance of public-private partnerships in general, but do contribute an insight into how different models of PPPs for the provision of TB treatment perform in South Africa in light of the HIV/AIDS epidemic. The study shows that performance is similar to that arising from the developing country literature. However, their relative importance and consequences in African context may be greater.

Fourth, the study documents different motivations for participation in public-private partnerships for the provision of TB treatment, and based on the motivations, proposes the most appropriate incentive structures suitable for different providers. In line with the literature on response to incentives by health care providers, private providers in the existing and potential partnerships appear to have both financial and non-financial incentives for participation in partnership for the provision of TB. They include free TB treatment drugs, payment for each patient treated, profit maximisation by minimising workdays lost due to illness, direct government subsidy, training on TB treatment guidelines, access to the public sector diagnostic facilities and equipment, controlling TB epidemic, regulation, and a good relationship with the government. In addition, the level of competition between private providers, regulatory framework, and social and political awareness also determine the success of partnership. In line with previous studies on private providers, this study highlights that involving private providers in the provision of services generates efficiency gains, and confirms the need for strong government capacity to negotiate, implement and monitor partnerships. Given the weak capacity in most of the African countries, this is perhaps even more important than in a developed country setting.

Fifth, the study considers options on the suitable public-private mix in the financing and delivery of TB treatment. It shows that a variety of public-private partnerships may arise, depending on the motivation of both the government and private providers to work together. For instance, a partnership with employer-based medical services could be appropriate where there is a large number of TB patients, or general public services are not easily accessible, as was demonstrated by the public-private for-profit case study. A community-based approach is appropriate in urban and peri-urban areas, and where community-based NGOs operate. A model involving private practitioners would be appropriate in urban areas. The most appropriate approach to partnerships with the private sector in a developing country setting is therefore highly context specific and may range across the whole spectrum of private providers (i.e. for-profit and non-profit).

Finally, the study's principal contribution to knowledge has been to provide evidence on the value of linking employer-based health care providers and community-based NGOs to the TB programmes in a developing country setting. This forms the empirical information base for policy-making.

10.6 Policy recommendations

Based on the findings of the study, recommendations on how policy-makers in South Africa and elsewhere could best approach a policy on the enhanced role of the private sector providers in TB treatment, and what is likely to be appropriate for different models of public-private partnership, are developed.

1. *The role of public-private partnerships as a component within the health system must be clarified.* The study shows that a well co-ordinated and appropriately targeted partnership between government and the private sector may improve equity (in terms of access and quality of care), efficiency (in terms of affordability and cost-effectiveness), and bring TB sufficiently under control. In the light of the public sector budget constraints, and the perception that the public service delivery is inefficient, implementing PPPs could promote efficiency and potentially maximise the use of existing resources. Although private providers largely focus on the need to minimise costs of the private care provision (due to market saturation and falling insurance coverage levels), there is a need to avoid duplication of resources and to make better use of existing resources across sectors. This could potentially be achieved through PPPs. The feasibility of different models of public-private partnerships for the provision of TB treatment will depend upon the contextual circumstances such as the existence of appropriate socio-economic conditions, including the extent of coverage by third party payment schemes; the size and distribution of the private sector providers, and their degree of organisation; and, government institutional and financial capacity. Working with the NGOs and employer-based medical service providers through partnerships seems to be more

feasible in the short term than contracting out private practitioners, as partnerships make fewer demands on government.

2. *Partnerships between the public and private sectors should be seen as complementary to public services as the different models serve different target groups.* Through partnership with the government, mining companies and community-based NGOs can take most of the responsibility for their own employees and associated communities respectively. Employer-based TB treatment is appropriate in companies that employ a large number of people and/or where occupational health clinics exist. The NGO model is well-suited to areas of high unemployment and where geographical access to health facilities for patients is poor. The NGOs play an important role in community contributions, since these organisations are closer to the community than the formal health care sector. This model of delivery is likely to be particularly successful because NGOs are already working with general health services and are part of the health care system. The mining companies, on the other hand, already have the infrastructure and good-working systems in place. The public sector services can cope with those not in employment, including children and the indigent. Partnerships with community-based NGOs and employer-based medical services should be established where the government does not have the capacity to provide services or because they lead to greater access, quality of care and more cost-effective service. Thus, PPPs help expand the provision of TB treatment in areas of operation through supplementing clinic-based provision so that the health system in general is better able to detect more TB cases, improve quality of TB treatment and reduce the cost per patient cured. The study findings suggest that the cost savings could accrue to the overall

health system if PPPs are used more widely. Secondly, freeing up higher-cost nursing staff to attend to professional level work is more efficient than using their time for DOT. Thirdly, increasing both detection and cure rates would potentially reduce the number of new TB cases and their associated costs to the health system. Similar approaches to PPPs could be extended to improve the provision of services for STI and HIV/AIDS.

3. *In order to achieve and sustain the targets that the South African DOTS strategy has set up, the public sector should initiate pilot projects involving partnerships with private practitioners in urban areas.* Recent analysis of TB control goals found that despite broad coverage through public programmes, proportionate increases in case-detection rates were not achieved. Projections suggest that at current rates, even if there were 100% coverage by DOTS, only half of new infectious cases would be detected. Key reasons for this are that patients do not have access to public health facilities or seek care from providers not linked to national programmes or the public health system - such as private doctors working in their own facilities or for employer health services. A variety of provision and financing models needs to be considered in developing country health systems. Even with strengthened public health provision, the resulting outcomes may not be as expected. The findings of the study show that in urban areas both NGOs and purely public sites had greater default rates. This may well improve by using PPPs involving other types of private providers such as private practitioners. Whilst a number of pilot projects involving private practitioners in the provision of STIs have been established in South Africa, these types of arrangements in the provision of TB treatment are limited.

4. *Provincial TB Control Programmes should establish a body with representation from the public and private sector to identify potential partners and take a joint responsibility for quality control.* The main tasks of this body would enable dialogue between the public and private sectors in order to find ways of collaboration. This could be achieved through establishing opportunities for engagement between the public and private sectors, such as offering relevant training to private providers on the national TB treatment guidelines. One of the most important determinants of the success of a partnership is the "buy-in" of all the participants to it. Thus, ensuring that both public and private partners believe in and are committed to collaborative efforts is of key importance to their success. A starting point of authentically engaging all parties in the process is creating a clear understanding of each one's role in the overall relationship. Furthermore, one cannot envisage the private sector take on the risk, and feel responsible for the outcomes, unless it has a sense of ownership of the programme. Private ownership may have an intrinsic effect by providing appropriate incentives to the service providers.

5. *In order to achieve a particular public-private partnership for the provision of TB treatment, policy-makers must recognise the dynamic nature of the relationship between public and private providers.* In addition, it has to be acknowledged that the public sector has to compete with the private sector for resources, human resources in particular. The public sector is faced by human constraints, and engaging the private sector in the provision of TB treatment seems a viable option to deal with competition.

6. *Provincial TB Control Programmes must devise incentive mechanisms in a way that the PPPs promote key goals of efficiency and accessibility.* Approaches that involve private sector need to recognise the incentives they face and work within these to encourage better practice and improve quality of care. Different set of incentives would be appropriate for different private providers. Training, free access to the public sector diagnostic facilities and drugs, and payment of a set fee for each patient treated, are potential incentive mechanisms for private practitioners and employer-based service providers. For NGOs, direct subsidies, training, and good relationship with the government would be important incentive structures. More complex mechanisms could involve contracting and financing private providers (such as private practitioners) to provide TB treatment. Other mechanisms are franchising and accreditation, where the private provider ensures the quality of the TB service provided. In the case of accreditation, private providers would be expected to provide detailed information on the TB service provided and their facilities are subject to inspection for evidence of quality indicators. All these mechanisms require careful monitoring and feedback on performance.

7. *Provincial TB Control Programmes should develop guidelines for monitoring and evaluating the performance of PPPs to ensure that private partners, in collaboration with the national TB programme, deliver care consistent with the DOTS strategy.* Whilst the provision of subsidies and free TB treatment drugs might be appropriate incentive structures for private providers to deliver high quality of care to TB patients through partnerships, it is important that the public sector maintains control by ensuring that all providers of TB treatment follow the national TB treatment guidelines. The use of a regulated PPP should be constrained to situations where the

problems of information asymmetries largely can be overcome. This would be appropriate where the type of service provision is subject to reasonably objective measurement, both in financial terms and actual service delivery. Regulation of the private sector is only a long-term strategy that requires substantial capacity within government, resources and information processing, and it appears that an appropriate set of incentives would be more feasible.

8. *To ensure the long-term sustainability of public-private partnerships within the broader system, the public treasury should secure funding for those models of PPPs that provide good quality and cost-effective TB treatment.* According to the economic theory on the role of government, and in light of the study findings, a priority role for the public sector is to finance TB treatment and secure that TB treatment is provided to all those in need. It can directly provide services to those who are unemployed, children and the indigent. However, in order to benefit from the efficiency of the private sector, different models of PPP could be designed, and appropriate incentive mechanisms devised for each model, to provide and finance TB treatment to those who are employed, low income workers, and poor community members. Employer-based medical services and community-based NGOs, both in partnership with the public sector, provide better quality of care and more cost-effective TB treatment when compared to purely public TB treatment.

9. *Provincial TB Control Programmes should formalise interactions between the public and private sectors through contracting.* Public funding might be used to reimburse fully private providers for the delivery of either specific services particularly poorly covered by the public sector in the provider's area or a complete

range of services to a defined population. Contracts could be established with private providers for the provision of TB treatment when no alternative is available. By encouraging the delivery of service at no charge, this approach might facilitate increased coverage in areas of particular need where ability/willingness to pay is limited. Contracting, however, has a central paradox of promising to relieve a heavy burden on government resources, but consequently needs much more of the resources focused on regulation and financing. Contracting is not an answer for poor capacity. It is a technique for institutional re-organising in the public sector context and in certain task networks. To ensure that this tool works properly there must be: a clear rationale for negotiations between parties; equal managerial capacity in both parties; and a competitive environment for bidding for and awarding contracts. If these conditions are met, there is a possibility of realising significant efficiency gains and better quality in services. However, where these conditions are not all present, risk will be unequally distributed which will then introduce an unfair agent relationship and sabotage successful exchange and implementation from the very beginning. It is absolutely necessary that as the goals and rationale behind contracts become more explicit, and as the government strengthen its capacity, contracts continue to be scrutinised and questioned to see if they have resulted in the gains they promised.

10. *The National Department of Health should develop a legislative framework around PPPs in the provision of TB treatment, and build strong technical capacity within the public sector to draw and manage contracts with private providers.* This would involve providing guidance and relevant training to managers at provincial level on the tasks associated with managing partnerships. Managing PPPs is

challenging as they embody a complex set of relationships between public and private actors and require careful monitoring. Monitoring contract performance requires institutional capacity (Palmer, 2002) which is lacking in most of the developing countries. Building the capacity is, therefore, one of the main challenges facing policy-makers in South Africa and other African countries.

10.7 Agenda for future research

The study findings suggest that public-private partnerships for the provision of TB treatment are worthy of serious consideration by planners and policy-makers in the three study provinces, and in similar areas in South Africa. Some adaptation of the study models may be necessary and the types of incentive mechanisms need careful consideration, but in general experience in this area strengthens the case for the promotion of public-private partnerships in health care that is already underway in South Africa.

The central question which arises from the conclusions drawn in this study relates to how to scale-up public-private partnerships for the provision of TB treatment. It has been highlighted that for achieving the South African target of detecting 70% of infectious cases and curing 85% of those detected, additional funding is likely to be required for new kinds of interventions, such as public-private partnerships. There is a need to estimate future resource requirements for a scaled-up response of tuberculosis treatment, assessing the role of public-private partnerships in alternative financing strategies, in order to inform the policy makers of the likely impact of the dual HIV/TB epidemic on the cost and potential impact of different models of the provision of TB treatment. Methodology on modelling to estimate required levels of future resources for TB control for different PPP models is needed.

HIV-related TB cases are a burden on the already scarce resources in developing countries, in particular in sub-Saharan Africa where the epidemic is the highest. Information on expenditure suggests a large and growing private health sector in most developing countries. The World Health Report 2000 shows that private expenditure on health accounts for a major portion of total expenditure in almost all of the high TB burden countries (World Health Organisation, 2000b). Moreover, almost all of this private expenditure is out-of-pocket, suggesting considerable utilisation of private practitioners and private pharmacies in a fee-for-service basis. Identification and estimation of the expenditure on TB treatment, and levels of coverage, in both public and private (for-profit and not-for-profit) sectors in developing countries is needed. This will lead to greater elaboration of options related to different financing and delivery of services structures.

Given the scale of the HIV/AIDS epidemic in many developing countries, and its impact on TB caseloads, the existing levels of resources are likely to have to increase in future, and additional funds will be required to cope with the problem. There is a need for an assessment of the resources required to provide TB diagnosis and treatment over the next five to ten years in the specific context of the HIV/AIDS epidemic. The implications that the HIV epidemic has for TB control and its resource requirements have not yet been estimated on a country-level. Modelling of the likely impact of HIV/AIDS epidemic on TB treatment and its impact on required levels of future resources will add to a limited knowledge about resource requirements for TB treatment.

Options on the suitable public-private mix in the financing and delivery of TB treatment involving private practitioners and traditional healers have not yet been given adequate consideration by most national tuberculosis programmes. This study has found that there is much larger potential to involve an array of actors in the provision of TB treatment. One of the study recommendations is for the public sector to initiate pilot projects involving private practitioners in the provision of TB treatment in urban locations. Identification and evaluation of additional models of public-private partnerships for TB interventions which have the potential to be scaled up (such as private practitioners) is needed.

As discussed in this thesis, one of the reasons for good compliance at the workplace in a mine setting is the system of 'parading' where the patient has no choice but to adhere to the treatment. Research into the ethical side of this approach is needed. In addition, knowledge is lacking about the barriers to adherence that patients face and ways of improving compliance that are needed and appropriate in different contexts/settings.

Finally, the study provides an insight into the appropriate incentives structures needed for a well-functioning partnership. Reforms in health care systems of developing countries frequently focus on 'incentive compatibility' or 'getting incentives right' but a body of convincing empirical research on the effects of various incentives mechanisms on provider behaviour in developing countries is lacking. Future studies should explore in more depth different incentive mechanisms most appropriate for different private providers. Issues around the incentive response, how different providers respond to different incentive mechanisms, and approaches to more effective monitoring of partnerships should be examined.

10.8 Conclusion

This thesis evaluated the performance of different models of PPPs in the provision of TB treatment, and explored incentive mechanisms for private sector participation. A common framework was used to analyse quality of care, cost-effectiveness and incentives in different PPPs. A multiple case study approach was used, employing both quantitative and qualitative methods. The small number of existing DOTS-based models of PPP available for the study together with the limited number of sites on which the policy recommendations were made, and differences in HIV prevalence rates in these sites were the main research limitations. Nevertheless, the thesis reached its aims and objectives. The main study findings are that the quality of care is superior in both models of PPPs when compared to the purely public sector model of delivery; PPPs could significantly reduce costs to both the public health sector and patient, and increase cost-effectiveness of TB treatment; and that private providers have both financial and non-financial incentives for participation in partnership. They have the potential to improve the affordability and efficiency of TB treatment, and improve the South African health system's capacity to cope with the impact of the HIV/AIDS epidemic.

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LIST OF APPENDICES

APPENDIX I

Interview schedule for key informants

1. Who are the main providers of TB treatment? What are they main characteristics?
2. Are there formal/informal interactions between the public and private sectors in the provision of TB treatment?
3. What relationships do private providers have with the provincial departments of health?
4. What are the existing partnerships for the provision of TB treatment?
5. What is the current policy in public-private partnerships for the provision of TB treatment?
6. What is the annual national budget for TB activities?
7. Is there a strategy for involving private providers in TB control activities?
8. Are there national guidelines on how to interact with the private sector in the provision of TB treatment?
9. How do you see private practitioners getting involved in the provision of TB treatment?
10. Describe the institutional and regulatory environment within which different private providers provide TB treatment.
11. What is the role of other stakeholders/professional bodies?

APPENDIX II

Differences between the National TB Control Programme and the Chamber of Mines' guidelines

	National	Mining industry
Case finding		
RSP	• No	• Yes (at least annually)
Passive	• Yes	• Yes
Contact tracing	• No (except for children)	• Yes
Diagnosis		
Sputum smear	• Yes (2 smears)	• Yes (3 smears)
Sputum culture	• 1 sputum for culture if smear negative at diagnosis and unresponsive to a course of antibiotics	• All patients with suspected pulmonary TB should have 1 sputum specimen submitted for culture
	• Failure to convert smear	• Failure to convert smear
	• Re-treatment TB	• Re-treatment TB
Identification	• No	• Yes (NTM)
Drug susceptibility testing	• Failure to convert smears and for all re-treatment cases at diagnosis	• Same
Admission criteria		
Smear positive	• No	• Yes
Clinically indicated	• Yes	• Yes
Re-treatment TB	• Yes (initial phase)	• Yes
Treatment§		
New TB	• 2RHZE/4RH	• Same
	• 2RHZES/1RHZE/5RHE	• Same
Re-treatment TB	• 5 days/week (initial)	• 5 days/week (initial)
Treatment frequency	• 5 or 3 days/week (continuation)	• 5 days/week (continuation)
Smear negative TB	• Yes, if no response to broad-spectrum antibiotics and CXR compatible	• Same
Directly observed	• Yes (intensive phase)	• Yes
	• Yes, if possible (continuation phase)	• Yes
Multi-drug resistant TB	• Individualised/standard	• Same
CXR		
At diagnosis	• Yes, if ≥ 1 smear is negative	• Yes, on all patients
Follow up	• No	• Yes
Treatment outcomes	• As per definitions	• Same

RSP = Radiological screening programme
NTM = non-tuberculosis mycobacteria.
CXR = chest radiograph
H= isoniazid. R = rifampicin. Z = pyrazinamide. E = ethambutol. S = streptomycin.
§ Fixed dose combination tablets should be used fro RHZE, RHE and RH

APPENDIX III

Sample letter requesting consent from individual/organisation

Organisation____________________

Attn.__________________________

Date

Dear_______________

The University of Cape Town, in collaboration with the London School of Hygiene and Tropical Medicine, is undertaking a study to evaluate public-private partnerships in the provision of TB treatment in South Africa, in light of the HIV/AIDS epidemic. It also explores the motivation and incentives for existing and potential new public-private arrangements for TB treatment. It is hoped that this study will add to our better understanding of the private sector, and shed light on the most appropriate approaches for involving private providers in TB treatment in South Africa.

Different models of partnerships which will be studies and compared are:

- Public-private for-profit (mines)
- Public-private not-for-profit (NGO)

Private and public provision will also be studied, to provide a comparison with the above models.

Information to be collected will include:

- The current dimensions of public and private health providers' involvement in TB control
- The cost and quality of care of TB services provided
- The capacity of the public sector to monitor partnerships for TB control and of the private sector to provide TB services
- Organisational and individual incentives to form a public/private partnership in TB care

It is hoped that the research will improve understanding of the role of the private sector in TB control in South Africa. More specifically, it is expected that the research will strengthen knowledge with regards to the public and private providers of TB services.

Finally, the range and type of private providers who might potentially become partners in delivery and financing of TB services, their motivations, the desirability of partnerships with them and how to manage relations with these different groups will be identified.

Your organisation is one of those that potentially could play an important role in TB control activities/policy making in the Western Cape. We would like to request your participation in this study by agreeing to be interviewed about public-private mix issues in TB control. Your identity, and the one of the organisation you represent, will be kept confidential. We will provide you with overall results of the study.

We hope that you will respond favourably to this request. Thank you.

Sincerely yours,

Edina Sinanovic
Principal Investigator

Consent to Participation in the Study:

Tuberculosis treatment in high TB/HIV settings: evaluating public-private partnerships in South Africa

Principal Investigator:
Edina Sinanovic, Researcher, University of Cape Town

I have read the summary of the research project and I understand what will be required of the organisation if we take part in the study. My questions concerning this study have been answered by Ms Sinanovic. I understand that at any time ____________________ may withdraw from this study without giving a reason.

________________________________ agrees to participate in this study.

Signed.. Date..................................

Name________________________________

Title_________________________________

On behalf of ____________________________

APPENDIX IV

Quality of care criteria and scores for TB services

		Site A	Site B	Site C	Site D	Site E	Site F
Category 1: Infrastructure	**Total**	**9.63**	**9.63**	**5.42**	**8.94**	**8.94**	**6.89**
1. Electricity	**Score**	8.00	8.00	8.00	8.00	8.00	8.00
(a) None	0.1						
(b) Power fails more than 6 times/year and no backup system	2						
(c) Power fails up to 6 times/year and no backup system	4						
(d) Power failures occur – there is a working backup system	8						
(e) Reliable power supply or automatic backup system	10						
2. Toilet	**Score**	10.00	10.00	2.00	8.00	10.00	8.00
(a) No toilets	0.1						
(b) Less than 3 toilets per 100 patients per day	2						
(c) Adequate toilets (3+ per 100 patients) but no wheelchair access toilet	8						
(d)Adequate toilets including one wheelchair access	10						
3. Functioning refrigerator	**Score**	10.00	10.00	8.00	8.00	8.00	8.00
(a) None	0.1						
(b) Alternative fuel supply, no spare cylinder	1						
(c) Alternative fuel supply with spare cylinder	9						
(d) Electric	10						
4. Emergency kit	**Score**	10.00	10.00	10.00	10.00	10.00	3.00
(a) No emergency kit available	0.1						
(b) Emergency kit on site but incomplete or inaccessible	3						
(c) Complete emergency kit available and accessible	10						
5. Drug storage	**Score**	10.00	10.00	10.00	10.00	10.00	10.00
(a) No drug cabinet or room	5						
(b) "Lockable" cabinet/room	10						
6. Cleanliness	**Score**	10.00	10.00	2.00	10.00	10.00	7.00
(a) More than one area of the facility is dirty	2						
(b) One area of the facility is dirty	7						
(c) All areas in the facility are clean	10						
"area of the facility" = e.g. toilets, floors, rooms, corridor, waiting space							

		Site A	Site B	Site C	Site D	Site E	Site F
Category 2: Access	**Total**	**8.77**	**9.68**	**6.44**	**7.27**	**5.98**	**6.44**
1. Size of building for patient load	**Score**	10.00	10.00	3.00	7.00	3.00	7.00
(a) Overcrowded every day	3						
(b) Overcrowded on peak days only	7						
(c) Facility crowded on peak days, rarely overcrowded	9						
(d) Facility never crowded	10						
2. Range of TB services	**Score**	10.00	10.00	8.00	8.00	8.00	8.00
(a) TB treatment only	6						
(b) TB treatment and laboratory investigations	8						
(c) TB treatment, laboratory and radiology investigations	10						
3. Emergency instructions after hours	**Score**	10.00	10.00	8.00	8.00	8.00	8.00
(a) No after-hours instructions/contact/phone	8						
(b) Instructions clearly visible	10						
4. Facility opening times	**Score**	10.00	10.00	8.00	8.00	8.00	8.00
(a) Facility opens less than 40 hours over fewer than 5 days	3						
(b) Facility opens less than forty hours but over 5 days	6						
(c) Facility opens at least 40 hours over 5 days or more	8						
(d) Facility opens more that forty hours over 6 days and/or includes some evenings	10						
5. Availability of TB treatment after hours	**Score**	8.00	8.00	10.00	10.00	6.00	6.00
(a) Limited and within working hours	6						
(b) After hours during the week days	8						
(c) After hours during the week days and on weekends	10						
6. Position in relation to community served	**Score**	10.00	10.00	6.00	6.00	6.00	6.00
(a) Facility is within 2km for less than 40% of population served	1						
(b) Facility is within 2km for 40-80% of population served	6						
(c) Facility is within 2km for 80% of population served	10						
7. Transport for TB patients	**Score**	5.00	10.00	5.00	5.00	5.00	5.00
(a) Not available	3						
(b) Available occasionally	5						
(c) Available all the time	10						

		Site A	Site B	Site C	Site D	Site E	Site F
Category 3: Management and staffing	**Total**	**7.70**	**7.70**	**7.02**	**7.02**	**2.92**	**2.92**
1. Continuing education (seminars, conferences, courses, etc)	**Score**	7.00	7.00	7.00	7.00	7.00	7.00
(a) No formal continuing education	3						
(b) Informal, infrequent (every two months or longer), continuing education	7						
(c) Formal, structured continuing education programmes available to all categories of staff	10						
2. Patient load per full time equivalent (FTE) ***consulting*** **staff (doctor, primary health care nurse)**	**Score**	10.00	10.00	7.00	7.00	1.00	1.00
	1						
(a) Over 45 or under 15 patients are seen per day per FTE staff	7						
(b) Between 40-45 or 15-28 patients are seen per day per FTE staff	10						
(c) Between 28 and 40 patients are seen per day per FTE staff							
3 Patient load per FTE ***professional*** **staff (doctor, primary health care nurse, professional nurse, enrolled nurse)**	**Score**	10.00	10.00	7.00	7.00	1.00	1.00
	1						
(a) Over 45 or under 15 patients are seen per day per FTE staff	7						
(b) Between 40-45 or 15-28 patients are seen per day per FTE staff	10						
(c) Between 28 and 40 patients are seen per day per FTE	**Score**	3.00	3.00	7.00	7.00	3.00	3.00
4. Quality assurance at the facility	3						
(a) No mechanism for quality assurance at the facility	7						
(b) Informal or ad hoc approach to quality assurance	10						
(c) Comprehensive approach to quality control	**Score**	10.00	10.00	10.00	10.00	10.00	10.00
5. Record system	1						
(a) Not possible to link a TB patient to his/her record	10						
(b) Possible to link a TB patient to his/her records	**Score**	10.00	10.00	5.00	5.00	3.00	3.00
6. Active defaulter tracing in place	0.1						
(a) No system in place	3						
(b) Restricted (system in place but no resources)	5						
(c) Yes, for some patients (e.g. patients supervised in the community)	10						
(c) Yes, for all patients							

		Site A	Site B	Site C	Site D	Site E	Site F
Category 4: Drugs and diagnostic testing	**Total**	**9.31**	**10.00**	**6.57**	**7.54**	**8.10**	**7.54**
1. Standard TB Control Programme Practical Guidelines	**Score**	10.00	10.00	10.00	10.00	10.00	10.00
(a) No copy of the Guidelines is available	2						
(b) A copy of the Guidelines is available	10						
2. Essential TB drugs	**Score**	10.00	10.00	5.00	10.00	10.00	10.00
(a) Essential TB drugs not available	0.1						
(b) At least one essential TB drug not available for a week	5						
(c) All essential TB drugs at the clinic are available	10	10.00	10.00	5.00	5.00	5.00	5.00
3. Diagnostic testing	**Score**						
(a) No diagnostics tests are available in the facility	0.1						
(b) Either laboratory or radiology tests available only in the facility	5						
(d) Both Laboratory and radiology tests available in the facility	10	10.00	10.00	7.00	7.00	7.00	7.00
4. TB screening	**Score**						
(a) No active case finding in place	7						
(b) Active case finding in place	10						
5. Turn around time for sputum smear test results (time taken between taking a specimen from the patients and receiving the results at the health facility)	**Score**	7.00	10.00	7.00	7.00	10.00	7.00
(a) More than 3 days	0.1						
(b) Between 48 hours and 3 days	7						
(c) Less that 48 hours	10						

		Site A	Site B	Site C	Site D	Site E	Site F
Category 5: Patient environment	**Total**	**5.64**	**8.03**	**6.64**	**7.36**	**8.18**	**6.69**
1. Waiting time	**Score**	10.00	10.00	8.00	8.00	5.00	5.00
(a) Over 60 minutes	3						
(b) 45-60 minutes	5						
(c) 30-45 minutes	8						
(d) Under 30 minutes	10						
2. Waiting area	**Score**	10.00	10.00	10.00	10.00	10.00	10.00
(a) Some patients have to wait outside with no shelter from sun/rain, no seating	3						
(b) Some patients wait outside but with shelter AND seating	7						
(c) Patients are all accommodated inside but some have to stand/sit on floor	8						
(d) Patients are seated inside on most days	10						
3. Patient privacy	**Score**	6.00	10.00	6.00	10.00	6.00	10.00
(a) No audial or visual privacy	1						
(b) Visual privacy but little/no audial privacy	6						
(c) Complete audial and visual privacy	10						
4 Patient complaints/suggestions	**Score**	9.00	9.00	9.00	10.00	10.00	9.00
(a) No mechanism for complaints/suggestions	8						
(b) Possible to complain but not simple/anonymous	9						
(c) Clear system for complaints/suggestions	10						
5. Health education material	**Score**	3.00	3.00	10.00	10.00	10.00	10.00
(a) None on display or available	3						
(b) Inappropriate materials on display only	4						
(c) Appropriate materials on display only	8						
(d) Appropriate materials on display and available to take home	10						
6. Safety	**Score**	2.00	10.00	2.00	2.00	10.00	2.00
(a) First sputum specimen is collected in the clinic (e.g. consultation room, toilet, waiting room, etc)	2						
(c) First sputum specimen is collected in a well ventilated area or outside without others watching	10						

		Site A	Site B	Site C	Site D	Site E	Site F
Category 6: Technical quality of care	**Total**	**8.94**	**8.94**	**8.30**	**8.30**	**8.94**	**8.61**
1. Knowledge of the most common symptoms of pulmonary TB by health care providers (doctor, nurse and treatment supporter)	**Score**	10.00	10.00	8.00	8.00	8.00	8.00
(a) Poor (less than 3 symptoms mentioned)	0.1						
(b) Adequate (between 3 and 5 symptoms mentioned)	8						
(c) Very good (all 7 symptoms mentioned)	10						
2. Knowledge of the first diagnostic test for confirmation of pulmonary TB by health care providers	**Score**	10.00	8.00	10.00	8.00	10.00	10.00
(a) Poor (not sure)	0.1						
(b) Adequate (mentions both the sputum test and x-ray)	8						
(c) Very good (sputum test)	10						
3. Knowledge of the essential drugs for pulmonary TB by health care provider	**Score**	10.00	10.00	8.00	8.00	10.00	10.00
(a) Poor (mentions only 2 drugs)	0.1						
(b) Adequate (mentions 4 drugs)	8						
(c) Very good (mentions all 5 drugs)	10						
4. Knowledge of side effects of TB treatment in pulmonary TB by health care provider	**Score**	8.00	8.00	8.00	8.00	8.00	8.00
(a) Poor (mentions less than 4 side effects)	0.1						
(b) Adequate (mentions between 4 and 8 side effects)	8						
(c) Very good (mentions all 13 side effects)	10						
5. Knowledge of management of side effects of TB treatment in pulmonary TB by health care provider	**Score**	8.00	10.00	8.00	8.00	8.00	8.00
(a) None (gives 1 correct answer)	0.1						
(b) Poor (gives 2 correct answers)	8						
(c) Adequate (all 3 answers are correct)	10						
6. Information given to TB patients by health care providers	**Score**	8.00	8.00	8.00	10.00	10.00	8.00
(a) Poor (mentions 1 out of 3 listed in the questionnaire)	0.1						
(b) Adequate (mentions 2 out of 3 listed in the questionnaire)	8						
(c) Very good (mentions all 3 listed in the questionnaire)	10						

		Site A	Site B	Site C	Site D	Site E	Site F
Category 7: Clinical treatment	**Total**	**8.00**	**8.00**	**4.00**	**8.00**	**3.00**	**3.00**
1. Proportion of patients who completed the treatment	**Score**	10.00	10.00	6.00	10.00	2.00	2.00
(a) Less than 70% of patients completed treatment	1						
(b) 71-80% of patients completed treatment	2						
(c) 81-84%of patients completed treatment	6						
(d) Over 84% of patients completed treatment	10						
2. Proportion of patients whose treatment was interrupted for two months or more	**Score**	10.00	10.00	6.00	6.00	2.00	2.00
(a) Over 27% of patients	1						
(b) Between 16% and 26% of patients	2						
(c) Between 5% and 15% of patients	6						
(d) Less than 5% of patients	10						
3. Proportion of patients who had their sputum converted to sputum-negative at the end of the first phase	**Score**	6.00	6.00	2.00	6.00	6.00	2.00
(a) Less than 50% of patients	1						
(b) 51-70% of patients	2						
(c) 71-84%of patients	6						
(d) Over 84% of patients	10						
4. Proportion of patients who are proven to be cured using microscopy at the end of the treatment	**Score**	6.00	6.00	2.00	10.00	2.00	6.00
(a) Less than 50% of patients	1						
(b) 51-70% of patients	2						
(c) 71-84%of patients	6						
(d) Over 84% of patients	10						

APPENDIX V

Interview schedule for facility manager

Date:
Facility (province):
Full name, title and position of interviewee:

Services delivered at the facility

1. What TB services are provided in this facility?

2. What proportion of TB patients are:
   - i) hospitalised?
   - ii) treated in outpatient department?
   - iii) treated in PHC clinic?

3. Are you implementing DOTS?

Yes	1
No	2

4. Please explain how DOTS works in your clinic? What system is in place?

5. What are the opening hours of this facility?

Is there night/emergency cover?

Yes	1
No	2

6. Does this facility offer TB treatment as part of after normal hours services (i.e. evening, week-ends, public holiday)?

Yes	1
No	2

7. Do you provide transport for TB patients?

Yes	1
No	2

8. Does your facility have a laboratory?

Yes	1
No	2

9. What TB diagnostic tests do you offer?

	Available on site	Sent away	Not available
Haemaglobin			
Blood Glucose			
Urine Microscopy			
TB Microscopy			
TB Culture			
Other microscopy and culture			

10. Does your facility offer X-Rays?

Yes	1
No	2
Nearby	3

if nearby, please specify where (and how far away)

Professional details and management of staff

11. How many and what type of health workers are involved in TB diagnosis and treatment supervision?

12. Was this the same before you entered into the partnership? Please describe any differences.

13. Has anyone at this facility received specialised training in management skills and/or supervision of staff?

Yes	1
No	2

If *Yes*, how many?

Management	
Supervision	

14. Are you a member of any professional organisation(s)/union(s)?

Yes	1
No	2

Which one(s)?

15. Where did you work before this job, and what are the main differences between working conditions here and your previous job?

16. What do you think are the main problem areas with regard to staff conditions at this facility? (e.g. salary, working environment, privacy for breaks and administration)

17. What could be done to improve them? What are the main obstacles to doing this?

In-service training

18. How many of your staff are trained on DOTS? (if applicable)

19. Is further training necessary?

Yes	1
No	2

If *Yes*, please specify

20. Do you feel that you are adequately trained for the job which you are expected to perform?

Yes	1
No	2

If *No*, what additional training do you think you would benefit from?

Service delivery and access

21. Which are the main groups in the community served by this clinic?

22. Is it possible for everyone who wants to, to get to this clinic and be treated here?

Yes	1
No	2

If N*o*, what would you say are the main obstacles?

23. Are there people living in this area who do not come to this clinic?

Yes	1
No	2

If *no*....Why? Where do they go to seek healthcare?

Quality assurance

24. Do you try to assess whether patients are satisfied with the TB care they receive at this facility?

Yes	1
No	2

If *Yes*....

25. Is there a mechanism for "consumer feedback"? (e.g. suggestion box)

Yes	1
No	2

26. Is it used by patients?

Often	1
Sometimes	2
Almost never	3

27. Is there a mechanism for patients to ask questions about the facility or any aspect of care? How does it work?

Yes	1
No	2

28. Is it used by patients?

Often	1
Sometimes	2
Almost never	3

29. Is there any other mechanism for patients to complain should they be unhappy with the care they receive or the attitude of a health worker? How does it work?

Yes	1
No	2

30. Is it used by patients?

Often	1
Sometimes	2
Almost never	3

31. Is quality of care assessed in any other way in this practice/facility? If *Yes*, explain how?

Yes	1
No	2

Cost data for TB treatment

Financial year

Facility

- *Management* (human resources and other)
- *Administration* (drug ordering and stock control; patient & other records staff; reception area staff, etc)
- *Overheads* (electricity, telephones & faxes, stationery, computer consumables, support staff – all staff not classified as clinical, admin and management, or maintenance, e.g. cleaning staff, gardeners, etc)
- *Clinical personnel*
- *Medical and surgical supplies*
- *Diagnostic tests* (laboratory and radiology)
- *Transport/vehicle running costs* (number of km travelled in year)
- *Maintenance* (building and vehicle)
- *Other costs* (including cleaning materials)
- *Buildings* (size)
- *Medical equipment* (a list of)
- *Furniture and other equipment* (a list of)
- *Vehicles* (type and make)
- *Training* (actual cost of training)

APPENDIX VI

Interview schedules for health care providers

Date:
Facility (province):
Full name, title and position held of interviewee:

Characteristics of provider

1. What is your most recent qualification? Year?

2. How long have you worked here?

3. Where did you work before this job?

Knowledge of diagnostic criteria and diagnostic procedures followed

4. How would you describe DOTS?

5. What are the most common symptoms of pulmonary TB?

Persistent cough (for 3 weeks and more)	1
Sputum production/productive cough	2
Shortness of breath and chest pain	3
Appetite and weight loss	4
General feeling of illness	5
Tiredness and loss of motivation	6
Night sweats and fever	7
Other responses (specify)	8

6. What is the first test you would use to diagnose a pulmonary TB?

Sputum examination	1
Chest X-ray	2
Sputum culture	3
Tuberculin (Mantoux) test)	4
Blood complete picture (CP)	5
Erythrocyte Sedimentation Rate (ESR)	6
Other responses (specify)	7

7. What special tests for diagnosis of pulmonary TB would you order?

Micro Dot / Anti Dot	1
TB culture/sensitivity	2
Acid Fast Bacili (AFB)	3
Tuberculin (Mantoux) test)	4
Other responses (specify)	5

8. Do you order TB culture and susceptibility tests on all re-treatment patients?

Yes	1
No	2

9. When do you order chest x-ray?

All patients	1
Patients with 2 positive sputum smears	2
Patients with 1 or 2 negative sputum smears	3
Patients with haemoptysis	4
Other (specify)	5

10. What is the method of confirmation of pulmonary TB elimination?

Sputum examination	1
Chest X-ray	2
TB culture	3
Tuberculin (Mantoux) test)	4
Blood complete picture (CP)	5
Erythrocyte Sedimentation Rate (ESR)	6
Other responses (specify)	7

Safety and efficiency

11. Where is the initial sputum specimen collected?

Outdoors	1
Well-ventilated area	2
Examination room	3
Toilet	4
Patient waiting room	5
Home	6
Other (specify)	7

12. What is the turn-around time for sputum smear results? Is more than 48 hours, please give reasons for the delay.

13. How long does it take to get TB culture results?

14. How long does it take to get a chest X-ray report?

Treatment methodology

15. Do you follow the South African TB Control Programme Practical Guidelines?

Yes	1
No	2

16. Is there a copy of the Guidelines available for staff in this facility?

Yes	1
No	2

17. Ask to see a copy and indicate which version is being used.

1996	1
1999	2
2000	3

18. Could you please list the essential pulmonary anti-TB drugs?

Isoniazid	1
Rifampicin	2
Pyrazinamide	3
Streptomicyn	4
Ethambutol	5
Other (specify)	6

19. What (combination of) drugs would you prescribe for a new pulmonary TB case?

2 months initial phase RHZE 120/60/300/200mg* (4 tablets for <50kg) RHZE 120/60/300/200mg (5 tablets for >50kg)	
4 months continuation phase RH 150/100mg (3 tablets for <50kg) RH 300/150mg (2 tablets for >50kg)	

R= rifampicin; H=isioniazid (INH); Z=pyrazinamide; E=ethambutol; S=streptomycin
* Ethamutol 225mg in combination is also acceptable

Management of side effects

20. What information do you provide to a TB patient?

Method of taking drugs	1
Adverse effects	2
Precautions	3
Other (specify)	4

21. What are the side affects of TB treatment?

Anorexia	1
Nausea	2
Abdominal pain	3
Burning sensation in feet	4
Orange/red urine	5
Skin itching/rush	6
Anaphylactic reaction	7
Deafness	8
Dizziness	9
Jaundice	10
Vomiting and confusion	11
Visual impairment	12
Generalised reaction, including shock and purpura	13
Other (specify)	14

22. What advice would you give to a patient undergoing TB treatment, if he/she complains of nausea?

Mentions... "*give tablets last thing at night*"

Yes	1
No	2

23. What advice would you give to a patient undergoing TB treatment, if he/she complains of orange/red urine?

Mentions..."*reassurance*"

Yes	1
No	2

24. What advice would you give to a patient undergoing TB treatment, if he/she complains of visual impairment?

Mentions..."*stop the treatment immediately and refer the patient to a specialist physician for an examination*"

Yes	1
No	2

Patient education

25. Do you have a patient education programme on TB?

Yes	1
No	2

26. What health education materials do you use (collect samples)?

27. Do you trace defaulters?

Yes	1
No	2

28. What system is in place?

29. Do you have resources to do this in practice?

Yes	1
No	2

30. How does it work in practice?

Follow Up Procedure

31. How many new TB patients are seen in one month (approximately)?

32. How often are pulmonary TB patients supposed to visit the clinic? (number of follow-ups advised)

Every (working) day	1
Every two weeks	2
Every two months	3
Other (specify)	4

APPENDIX VII

Outcome quality (TB patient records)

TB patient records - Check every 2nd patient in TB register for following: Facility:

Patient No.	Date of Diagnosis	Patient category and treatment regimen Correct/incorrect	Record of 2 month test: Yes/No	Result of 2 month test: Positive/Negative	Record of 5 month test: Yes/No	Result of 5 month test: Positive/Negative	Treatment stop date: Yes/No	Outcome	Remarks
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

In order to generate the following indicators:

1. Adherence to treatment:

- *% of patient population that completed treatment*
- *% of population commencing treatment that had a 5 month test done*

2. Cure rates:

- *2 month smear conversion rate: e.g. did they have the test? what was the result?*
- *% of population that commenced treatment in chosen period that had 5 months test done and were shown to be cured*

APPENDIX VIII

(a) Patient cost interview

1. Where do get your daily TB treatment?
2. How do you get to the clinic/treatment supporter? (e.g. walking, by bus/taxi)
3. How long does it take to get to the clinic/treatment supporter?
4. If relevant, what is the cost of a bus/taxi fare one way?
5. Are you employed?
6. If yes, what type of employment are you in? (full-time/part-time; formal/informal)
7. What is your monthly household income?

(a) R500 - R1000; (b) R1001- R1500; (c) R1501 - R2000; (d) R2001 - R2500; (e) R2501 - R3000; (f) More than R3000

(b) Process indicators for different components of TB treatment

Expected number of visits and diagnostic tests for a new smear positive pulmonary TB patient for each study site

	Public-private for-profit model		Public-private non-profit model		Purely public model	
	Site A	Site B	Site C	Site D	Site E	Site F
Hospital day	7	N.A.	N.A.	N.A.	N.A.	N.A.
Visit to clinic for monitoring	2	3	3	3	3	3
DOT visit to clinic	123	130	10	10	130	130
DOT visit to "treatment supporter"	N.A.	N.A.	120	120	N.A.	N.A.
Total DOT visits	123	130	130	130	130	130
Sputum smear test	4	7	6	6	6	6
Sputum culture	1	1	N.A.	N.A.	N.A.	N.A.
X-ray	3	3	N.A.	N.A.	N.A.	N.A.

In addition to 2 sputum smears, sites A and B conducted a sputum culture and a chest radiograph for all patients with suspected pulmonary TB. In site A, once diagnosed, all sputum smear-positive patients were hospitalised for the first 7 days, after which their treatment was observed in occupational clinics. In all other sites, patients were not hospitalised at all, and the treatment was observed in clinics or in the community. Doctors made a diagnosis in all study sites. Professional nurses observed the treatment in sites A, B, E and F, and lay workers "treatment supporters" observed the treatment is sites C and D (except for the first 10 days when patients were required to have their treatment observed at a clinic).

(c) Average provider costs

Average provider costs associated with TB diagnosis and treatment for each site (2001 Rand)

Cost category	Public-private for-profit model				Public-private non-profit model				Purely public model			
	Site A		Site B		Site C		Site D		Site E		Site F	
	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic
Hospital stay	245	269	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Health clinic visits for monitoring	52	60	46	53	50	65	53	69	50	53	56	58
Health clinic visits for DOT	20	23	17	20	24	31	24	33	27	28	31	32
Visits to "treatment supporters" for DOT	N.A.	N.A.	N.A.	N.A.	2.8	4	3.2	4	N.A.	N.A.	N.A.	N.A.
Sputum smears	25	25	17	17	24	24	24	24	24	24	24	24
Sputum culture	142	142	148	148	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Drugs	N.A.	391	2,970	3,282	391	391	391	391	391	391	391	391
X-rays	34	34	31	31	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Supervision of community-based programme	N.A	N.A	N.A.	N.A.	488	635	488	600	N.A.	N.A.	N.A.	N.A.
Training for" treatment supporters"	N.A	N.A	N.A.	N.A.	9	11	9	11	N.A.	N.A.	N.A.	N.A.

Cost data from 2001; N.A. = not applicable.

The total cost of treating a new smear-positive pulmonary TB patient from diagnosis to treatment completion was calculated by multiplying the average cost of each treatment component by the number of times the cost was incurred (process indicators as shown above), as defined by the National TB Treatment Guidelines, and then summing these totals.

APPENDIX IX

Interview schedules for existing public/private partners and potential private partners

1. Interview with public partners

Background

1. Briefly describe what PPPs for TB treatment exist in your province? Explain the history of PPPs for TB treatment in your province.
2. How did the decision to enter into a PPP rise?
3. Are you happy with current regulations affecting the practice of primary care private providers (specifically for TB)? Do they need changing? If so, how?
4. Do the PPPs for affect your ability to plan TB services for the whole province/district?

Characteristics of the partnership

5. What is the type of partner? (mines, NGO)
6. What is the nature of service/good provided?
7. What is the type of partnership (is there a contract in place)?
8. What is the objective of this partnership?
9. What are the responsibilities of the private partner? How are they defined?
10. What reimbursement (payment or other incentive) mechanism is in place? What is the exact value of the reimbursement?
11. What is the duration of the current agreement? Is this a first of subsequent agreement? If the latter, what was the duration of the initial agreement?
12. What is planned to happen at the end of the PPP agreement term? Why?
13. (if relevant) Before the PPP, what sort of relationships did you have with the private provider?
14. Who initiated discussions over a possible partnership?
15. What would you say were the province's reasons for agreeing to this type of partnership?
16. Was any analysis done before deciding to enter into the partnership (e.g. cost estimation)?
17. Were there any other alternatives open to you to get this service provided? If so, why did you reject them?
18. Overall, do you think the private provider has the appropriate resources (staff, buildings, equipment) to deliver an adequate TB service (e.g. as compared to public sector facilities)?
19. What do you think has been wrong/good with this partnership? (lessons learned)

Motivations and incentives

20. What do you think are private provider's reasons for this partnership?
21. What are the outcomes you want from this partnership?
22. What incentives are the best for the outcome you desire? What are your experiences?
23. Do you think that the compensation the private provider receives from the province is fair/too much/too little?
24. Do you trust the private provider?
25. How would you describe your current relationship with the private partner?
26. Has your relationship with the private provider changed over the period of the partnership? If so, in what way?
27. Have there been changes in the incentives in the past? How did that effect the behaviour?
28. What do you see as benefits of the PPP? (is the use of resources to deliver TB treatment more efficient because of the use of the private provider?)
29. What do you think drawbacks are?

Partnerships monitoring mechanisms (general for all types of partnerships for TB treatment)

30. What are the performance monitoring mechanisms built in to the agreement/contract?
31. What information do you get from the private partner about what he is doing? In what form? How frequently?
32. What is the main method which you use to measure service delivery? How effective do you think it is?
33. What would constitute a breach of agreement on the side of a private provider? What are the penalties? Are they enforceable? And on the side of the province?

Reimbursement mechanisms

34. How was the reimbursement mechanisms (or incentive) decided?
35. How do you think the way the private partner is reimbursed effects his/her behaviour and the quality of care provided?
36. Apart from the incentive to the provider, what other costs are associated with the partnership agreement?

Risk

37. What do you see as the existing or potential risks in a PPP as well as in the present agreement(s) with the private partner?
38. In your current partnership(s) with the private provider, who do you think would bear the risk of the PPP if something goes wrong?

39. Do you think that a partnership with a non-profit organisation is/would be less "risky" than with a for-profit organisation? Why?

40. What do you think are the main benefits and disadvantages to your organisation of the partnership? Do you see other potential benefits which haven't been realised yet?

Staff and staff capacity issues

41. What staff is involved in these PPPs? What proportion of their time do they spend on the PPPs?

42. Do you think you have the right skills and experience to manage PPPs? Is ability to go into PPPs likely to increase with experience?

43. Which do you think is more demanding for your staff: to manage PPPs or to manage direct provision of TB treatment? Why?

Future policy regarding partnerships for the provision of TB treatment

44. Would the province be interested in more PPPs with the private providers? If so, why?

45. Who would be your preferred private providers? (e.g. public, private for profit, private not for profit)

46. Do you think there are many providers of this type interested in partnerships? Would it be possible to attract in suppliers not currently working in your area?

47. If you were going to enter into the partnership with the same private partner again, how would you go about it?

48. What would an ideal PPP for the provision of TB treatment look like from your perspective?

2. Interview with private partners

Background

1. Describe the organisational structure, and how the provision of TB treatment is organised?
2. Before the partnership started, what sort of relationships did you have with the Department of Health?
3. Who initiated discussions over a possible partnership?
4. What were your reasons for wanting this partnership?
5. What is the objective of this partnership?
6. Why do you think the government wanted this partnership? What are/were his/her motivations? Do you trust him/her?

7. Has your relationship with the government changed over the period of the partnership(s)? If so, in what way? Would you say that the nature of the partnership is changing over time, if so, how?

8. Do you think the government has any alternatives now to the current partnership to get the TB service/good provided?

9. Who are your competitors in this market? How competitive do you think you are relative to your competitors in this market?

Motivations and incentives

10. What do you think are province's reasons for this partnership?

12. What types of incentives are needed for your organisation to provide TB treatment? What are your experiences?

13. Do you think that the compensation that you get from the province is fair/too much/too little?

14. How would you describe your current relationship with the private partner? Why do you characterise the partnership like that?

15. Has your relationship with the province changed over the period of the partnership? If so, in what way?

16. Have there been changes in the incentives in the past? How did that effect the behaviour?

17. What do you see as benefits of the PPP?

18. What do you think drawbacks are?

Scope and nature of the partnership

19. As the partner, what are your responsibilities in terms of provision of TB treatment? Are those the ones you would ideally want?

20. What are your responsibilities, as defined in the agreement, with respect to capital items, staff and supplies? Overall, do you think you have the appropriate resources (staff, buildings, equipment) to deliver an adequate TB service?

Partnership agreement review mechanisms

21. Are any performance monitoring or review mechanisms built in to the partnership agreement? How time consuming do you find this review process?

22. What do you think would constitute a breach of agreement under this relationship?

Reimbursement mechanisms

23. How would you describe your motivation for providing TB treatment? Is the current agreement in your view designed with these motivations in mind or would you like to see it

addressing different aspects?

24. What is the reimbursement mechanism (or incentive) specified in the agreement?

25. How do these reimbursement mechanisms affect the riskiness of the agreement from your perspective?

26. Do you think these reimbursement mechanisms influence the way in which you provide TB DOTS service? Do you think for-profit/ not-for-profit providers would behave similarly?

27. Apart from the direct costs of providing TB treatment, what other costs are associated with the agreement?

28. In addition, were there any transitional costs e.g. setting up new information systems?

Attitudes to risk, management systems and responses to partnership incentives

29. What do you see as the existing or potential risks in any PPP as well as specifically in the current partnership agreement?

30. In your current partnership with the province, who do you think would bear the risk if something goes wrong? Is this partnership regarded as posing high, medium or low risk to you?

31. Describe the management systems in place for managing the partnership.

32. What information do you give the government about what you are doing? In what form? How frequently?

33.Do you think the government uses this information to monitor your performance?

34. Have you had any problems in managing the partnership?

Performance of the partnership

35. What do you think are the main benefits and disadvantages to your organisation of the partnership with the government?

36. What do you think are the effects of this partnership agreement on the costs of services, and on the quality of care?

37. What would an ideal PPP look like from your perspective?

Attitude to increased use of partnerships for the provision of TB treatment

38. Would your organisation be interested in more partnerships with the government? If so, why?

39. Do you think there are many private sector organisations and providers interested in partnerships with the public sector?

3. Interview with potential private partners

Background

1. Briefly describe your organisational structure.
2. Is there a formal interaction between your organisation/facility and public sector facilities/ district and regional authorities?

Attitude to use of partnerships to deliver TB treatment

3. Would you be willing to treat TB patients in your rooms?
4. Would your organisation be interested in partnerships with the government for provision of TB treatment? If so, why?
5. Would you be willing to follow the NTCP guidelines and complete the register for TB?
6. How do you see your involvement in the provision of TB treatment with the government?
7. Do you think that you have the appropriate resources (staff, building, equipment) to deliver an adequate TB treatment? Do you think you have the right staff skills and experience to manage PPPs?
8. What would an ideal PPP for the provision of TB treatment look like from your perspective?
9. Have you been asked to participate in partnership? If yes, what is the reason for not participating?

Motivations and incentives

10. What are your reasons for wanting to get into a partnership with the government? What are incentives that should be in place to encourage your organisation's participation in partnership?
11. What do you see as benefits for you of PPP? What do you think drawbacks and risks are?
12. How would you describe your current relationship with the government?

Obstacles to providing TB treatment

13. Do you perceive obstacles to providing TB treatment? If yes, what are they?
14. Who are your competitors in this market? Do you think there are many private sector organisations and providers interested in partnerships with the public sector for the provision of TB treatment? Who are they? Would it be possible to attract in suppliers not currently working in this field?
15. How competitive do you think you are relative to your competitors in this market?

16. When were you last contacted by officials form the DoH to inform you about NTP guidelines? When did you last participate in a Continued Medical Education (CME) programme on TB treatment and control? Who organised this CME?

Referrals

17. If you suspect that a patient has TB, do you make a diagnosis or refer? Officially, where are you supposed to refer TB patients to? In practice, is this what you do?
18. What are the reasons for referrals? Do you think that you sometimes refer TB patients that you should be able to deal with here? Why?
19. How many new cases of pulmonary TB do you refer on an average in a month? Would you say, compared to one year ago, that this facility is referring more/less/about the same TB patients? (If there is a change, why?)
20. Do you notify the government (NTP/DoH) when a new TB patient comes to you for treatment?
21. What do you think is the role of private providers in the National TB Control Programme?